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ELECTRIC RAILWAY JOURNAL

Charles H. Clark, Engineer of Maintenance of Way for The Cleveland Railway Company. Mr. Clark is a former President of The American Electric Railway Engineering Association and is one of the best known traction men in the United States. He is also responsible for a number of inventions widely used today in track construction.

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"Track corrugation can be eliminated"

says CHARLES H. CLARK

"When the American Electric Railway Engineering Association's Committee on Corrugation visited Cleveland some time ago, the members remarked that corrugation in the Cleveland street car tracks was conspicuous by its almost complete absence," says Charles H. Clark, Engineer of Maintenance of Way for The Cleveland Railway Company.

"This freedom from corrugation is attributed to the method we employ in track construction," continued Mr. Clark. "All rails are laid on a solid foundation and are tilted inward to a slope of 1 in 25. This distributes the load more evenly over the head of the rail.

"Steel ties laid by my new method of second tamping insure the most rigid track foundation. All joints are mitred at an angle of 10 degrees, riveted, and then seam-welded, top and bottom.

"I believe track that does not vibrate will reduce maintenance, and the tracks of The Cleveland Railway seem to justify my theory."

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A section of Euclid Avenue, Cleveland, where Mr. Clark installed Carey Elastite System of Track Insulation. Although this is one of the most heavily travelled streets in Cleveland, the installation is markedly quiet and free from corrugation.

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There are 28,000 obsolete electric cars in operation today. Many progressive electric railway companies are replacing such equipment as rapidly as possible with modern cars and are obtaining an immediate increase in traffic at a lower cost per passenger. One company alone has experienced a 28 per cent increase in patronage in this way. (Watch for following advertisements for what has been accomplished in some cities).

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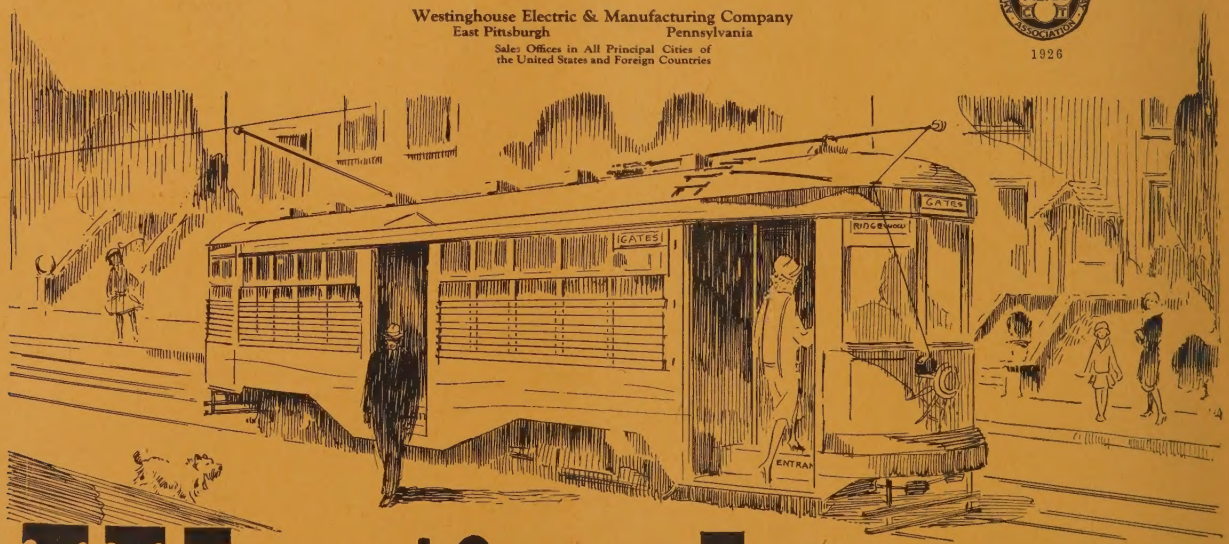

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

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So Those in the Industry May Know

EVIDENCE continues to accumulate of the misinterpretation by the daily newspapers throughout the country of the facts with respect to the recent bus applications made in New York City. It is true that in some of the elements which it contains the joint offer made on behalf of the New York Railways and the Fifth Avenue Coach Company does differ from similar offers made in the past, but it does not presage the passing of the street car, as many of the newspapers have concluded in their editorial comments.

It cannot be expected that editors distant from New York will be informed about transit matters in that city. The whole situation is extremely complicated. A recapitulation of the bus offers, made some time ago, disclosed that there were more than 50 on file. Others have come in since then. Commentators on the latest offer should bear in mind that the 25 miles of track, whose use it is proposed to discontinue, represents only about one-fourth the total mileage of the system. Most important, however, the plan does not represent an idea that is new. There have been similar replacements elsewhere in the past, proportionately as great, but the railway has remained the backbone of the system. Moreover, sight must not be lost of the fact that under the latest bus proposal the fares will be both 5 and 10 cents, whereas the present carfare is 5 cents.

These comments are not intended to be critical of this particular application or any of the others. It is easy to see what a colossal task it would be to analyze and compare all the offers made. As a matter of fact, this is a work upon which the city has been engaged for months. The problem of deciding what is best for the city is the concern of the Board of Estimate. When that decision has been made the New York Transit Commission will then have its say. No matter what the city of New York may do, the commission will undoubtedly exercise authority that will fit the proposal accepted by the city into the general plan designed to better transportation facilities in the city.

One thing and only one thing is here intended. That is to call the attention of street railway men everywhere to the importance of learning the facts about the New York proposal and making every effort to disseminate them in their own communities. There has been an alarming tendency on the part of the daily press to jump at conclusions. Such phrases as "the beginning of the passing of the street car from the leading cities"; "it costs less to operate the buses"; "adoption of the bus in populous American communities is daily becoming more expedient"; "there's a lesson in this—the trolley is obsolescent," are all too frequent in the daily press comments on the New York proposal.

To turn the tables on these critics by using almost the very words of one of them, there is a lesson in this, but it is not the unusual lesson which most of them make it out to be. It is the lesson not of wholesale replacement, but the lesson of the proper articulation of the two methods of transportation and of the use of each under conditions which dictate a choice between the two. It is up to the individual railway operator to correct any comment in the daily papers in his territory based on conclusions which start with a wrong premise. No silly statements similar to those quoted should be permitted by them to go unchallenged.

Full Knowledge of the New York Bus Plan Desirable

INTERESTS of the New York Railways and the Fifth Avenue Coach Company have joined to form the newly organized New York City Omnibus Corporation for the purpose of operating a co-ordinated rail and bus service in Manhattan. There is included in the Omnibus Corporation's plan a proposal to eliminate some 25 miles of street car lines in favor of buses. This is out of a total of some 88 miles. In the proposal is also the suggestion that additional surface rail lines may be removed in favor of buses whenever this becomes practicable.

There exists now in New York a keen competition for bus franchises, and various contenders are making strenuous efforts to devise terms that will win the coveted grants and at the same time permit operation to be carried on at a profit. Unless operation is at a profit service will quickly become crippled by the inability properly to maintain equipment.

It is apparent that the proposal of the Omnibus Corporation includes considerations that may work to induce the city administration to grant this company a franchise over other contenders. In this effort, steps may be proposed which in themselves would not be considered were not the matter of protecting existing investment by control of bus operation on Manhattan Island at stake.

Again, there is another important factor in the proposal to abandon some rail lines. The particular lines in question are not profitable. In fact, they haven't had a chance for many years. True, there are perpetual franchises, but they provide for a 5-cent fare and many other operating handicaps. At the present time the north and south traveler in Manhattan has only the choice of a crowded rapid transit system, a slow surface car or an expensive automobile. There has been no provision for any intermediate form of transportation which would be more comfortable or attractive than the congested rapid transit lines and

at the same time much less expensive than an automobile or taxicab. The north and south surface lines might well have supplied such service, but the arbitrary fixed 5-cent fare has stood like a stone wall in the way of improvement.

There has been one exception to this condition, namely, the operation of the Fifth Avenue Coach Company at a 10-cent fare. This service has been popular not because of its speed, but because a passenger may make his trip without the indignities of crowding. The provision of such a preferred transportation service is a proper function of the bus. The bus offers a solution of the situation under the proposal to substitute 10-cent bus lines that are expected to permit a character of service that will supplement rather than duplicate that of the rapid transit lines. The proposal seems a logical one under the circumstances, but similar conditions encountered are not found in any other city in the country.

Certain proposed crosstown lines are designed strictly as feeders to north and south bus lines or other transit agencies. Here the hauls are very short and no attempt to provide a preferred service is contemplated. A 5-cent fare will be charged on these buses with an additional 5 cents for a transfer to the north and south lines. The plan is a good one from the standpoint of providing more and better distribution of crosstown transportation. This is an important requirement in New York. The peculiar combination of street spacing makes a bad transit problem at best, and the crosstown bus lines will help materially.

Much more could be added regarding the restrictions which have been placed on street car operation that tend to favor the use of buses. The expensive conduit construction is in itself a handicap to car operation. Street traffic conditions are more severe in New York than in the majority of American cities. Unregulated parking exists on many streets, cutting down the effective roadway. Speeds are necessarily very slow, particularly on the crosstown streets.

But these subjects are technical and in a sense they are details. The important fact is that the proposed bus plan for New York is designed to meet unusual and peculiar conditions that are common alone to that city, and reflect in no sense a comparison of the relative merits of bus and trolley in municipal transportation. Here the bus is being fitted into a particular situation in which it seems to offer certain advantages. There is nothing new or significant in this as regards the bus-trolley situation. A similar process is going on in various parts of the country, where unprofitable sections of rail line have been abandoned and bus service substituted where it is suitable. This is in accordance with what has been generally recognized as good practice in the application of the bus.

The primary danger now is from curbstone transportation experts who do not understand the situation. There is danger that hasty generalizations may be made on the basis of the action proposed for decidedly specialized conditions. Electric railway executives owe it as a duty to their communities and properties to make every effort to acquaint their communities with the facts. They will at the same time be doing a service in the interests of the development of the bus by preventing the popular mind from being misled regarding its proper functions as a transportation agency.

There Still Is Room for Modernization and Merchandising

FUNDAMENTAL soundness underlies the electric railway business. This was conceded by speakers at the first sectional conference of the Advisory Council of the American Electric Railway Association, held at Chicago last week. It was the feeling, however, that the public has not been sufficiently impressed with the need for public transportation. At any rate, work remains to be done in pointing out that it is futile to expect a system to be operated and improved to meet the needs of a growing community without assuring safety of capital and an adequate return.

That the railways can do much to improve their own situation was indicated by the remarks on popularizing service. The cars on a property represent only some 15 to 20 per cent of the total investment. Yet frequently they are allowed to become a very unattractive feature. Since they are the salesroom of the company they should be kept in first-class condition. And this can be done at an actual saving in cost, it was pointed out.

But with all this, confidence in one's own property is essential. Unless railway men are sold on their own business they cannot hope to win the required support and confidence from the public that is so essential to success. These are the words of one of the most successful men in the utility field. Having gained this confidence and the support of the public, the rest is easy. Capital in sufficient quantity should flow in to care for all needed rejuvenation of the properties.

A New Viewpoint on Depreciation

DEPRECIATION is an operating expense, but its amount depends on the rate of destruction of property value. Hence its determination involves the consideration of many diverse elements. Usually the treatment of this subject has been from a rather narrow viewpoint, based on some theory which some writer is propounding. Such a method usually neglects fundamental factors, and occasionally leads to erroneous conclusions.

Since in the long run depreciation must be assessed against the car rider if service is to continue, it is essential that the burden be spread equitably. The many factors involved make it very difficult to charge the exact amount against each passenger, and in rate cases this has been a point for frequent argument. The amount of the charge is in general fairly large, being in many cases at least half as great as the return on the investment.

A wealth of information and an advanced viewpoint are contained in the series of articles by the late W. H. Maltbie now running in this paper. Probably the greatest authority on the subject, he treated it in a lucid manner that makes it easy of understanding and easy of presentation before public authorities. Seldom has a subject been treated with greater breadth and thoroughness.

These articles, which were completed shortly before Mr. Maltbie's death, serve as a fitting monument to a man who had won an outstanding position in the industry as a counsellor and a friend. His passing leaves a distinct vacancy which will be hard to fill.

Dallas Permits Its Railway to Grow

DALLAS, TEX., is to have a 7-cent cash fare with a 6-cent ticket rate. The new rate is based on the recommendation of the supervisor of utilities to the Mayor and the City Commissioner after an exhaustive study of the situation. Except for some untoward circumstance the Dallas Railway could probably have gone on indefinitely on the old basis, but under the straight 6-cent fare it could not do the things it wanted to do and that it knew should be done to keep abreast of the growth of the city. Its margin of profit was too small to permit this.

It is an interesting story of public relations, this outcome at Dallas. The company laid its cards on the table last summer. The matter was discussed, but the disposition of the Mayor and the City Commissioners was to hold the company to strict accountability under the terms of its franchise contract, a modified service-at-cost grant. So far as the company is concerned this would have been the easiest way out for it, but its sense of public responsibility would not permit it meekly to accept such restrictions. So it renewed its request.

In return for a rate of fare which gives promise of doing more than merely permitting the company to exist, its officers have obligated themselves in no unmistakable terms. The railway and the city's supervisor of public utilities did all that was in their power to reach a basis workable from the standpoint of the railway and not unduly burdensome on the people of the city. If the railway had not been permitted to grow so as to meet its responsibilities the stigma would have rested upon the Mayor and the City Commissioners. Upward of $1,450,000 will now go back into the property. Surely 1 cent additional for each cash passenger is not much of a price to pay under the circumstances. As the Dallas *News* so aptly said, the grant of an increased fare, or rather the fractional increase in fare, "will enable the company to finance its needs, which are the needs of Dallas."

Planning Ahead of Present Needs

BURIED in the news items recently was a prediction made by Frank H. Alfred, president of the Père Marquette Railway, that the day was coming when trains would run over concrete roadbeds reinforced with steel trusses, and that cars would run on roller bearings, with a speed approaching that of airplanes. Considerable ingenuity would of course be required to overcome the mechanical difficulties presented in a proposal of this kind, but after all, the matter would probably resolve itself into the economic problem of whether such a project could be made to pay, and whether the time interval will become so important a factor in our lives. While at present it might appear that there is not likely to be a need for anything of this nature, who would have thought, only fifteen years ago, that the day was almost upon us when we would have, and really need, thousands of miles of pavement on our country thoroughfares? Even today these thoroughfares are becoming inadequate and the ingenuity of highway builders is taxed to find means of obtaining the maximum use of the right-of-way. To meet this demand super-highways are being developed in Detroit, and Chicago is now contemplating a similar plan.

Steam railroad development in late years, has not been in the matter of speed. Progress in that regard was pretty rapid during the latter half of the nineteenth century. It need only be recalled that engine number 999 made its record of 112.5 m.p.h. on the New York Central Railroad as early as 1893. Steam roads during the last quarter of a century have paid less attention to the matter of speed than to the better application of that speed. The improvements have been along the line of comfort, safety and increase of all-around efficiency. No one would like the idea of being whizzed along at 112 m.p.h. in 1893 type wooden cars.

If speed is needed, and needed for mass transportation, a development such as Mr. Alfred has suggested might conceivably be superior to airplanes because of its present advantage in the matter of having terminals located in the centers of cities, as it frequently requires a journey of an hour or more to reach an airplane field from the center of the city. No doubt there would be difficulties in the execution; but ideas like Mr. Alfred's are always in order. It is well to plan just a little ahead of the present needs.

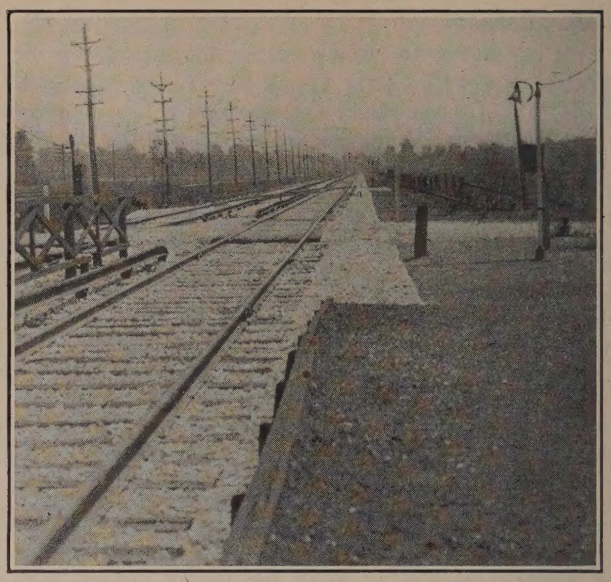
P.R.T. Scores Once More with "Market Basket" Plan

PRICES may rise and prices may fall, but hereafter the Philadelphia Rapid Transit employee will go on his way, untroubled by such mundane considerations. This enviable state comes as a result of the "market basket" plan of wage adjustment which the men and company have just agreed upon. Two years of intensive research on the part of various committees of men and of employers' representatives have finally borne fruit in this agreement. Now the men will have the comforting assurance of a satisfactory standard of living, no matter what untoward economic crisis descends upon the country.

The plan also provides a stimulus toward increased operating efficiency among the employees, since they will share with the management in any surplus which may accrue over and above the dividend return on preferred stock. Points such as this would seem to indicate that Mitten Management has scored, as well as the men, in promoting a further spirit of mutual accord. A number of leading economists have given the terms of the agreement the stamp of their approval. From the theoretical standpoint it is par excellence—the last word in labor agreements.

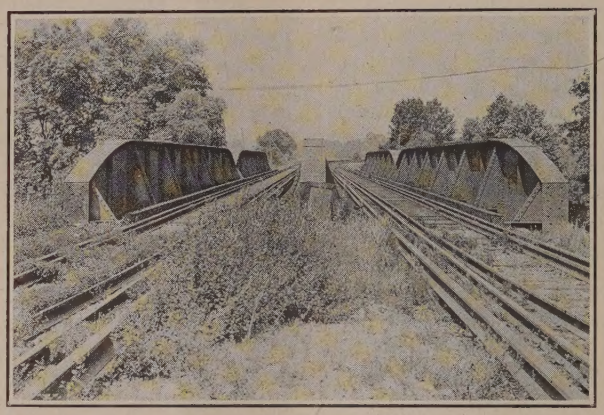
Now it simply remains to determine how the mechanism of the plan will function in actual practice. The agreement provides that wage adjustments will be made once a year on the basis of an index figure determined by the cost of twelve typical market baskets, unless the fluctuation of the dollar's purchasing power exceeds 10 per cent for a period of three months or longer. As living costs take an upward trend the men will find more dollars in their pay envelopes. Conversely, as the cost of living decreases a corresponding reduction in pay will follow.

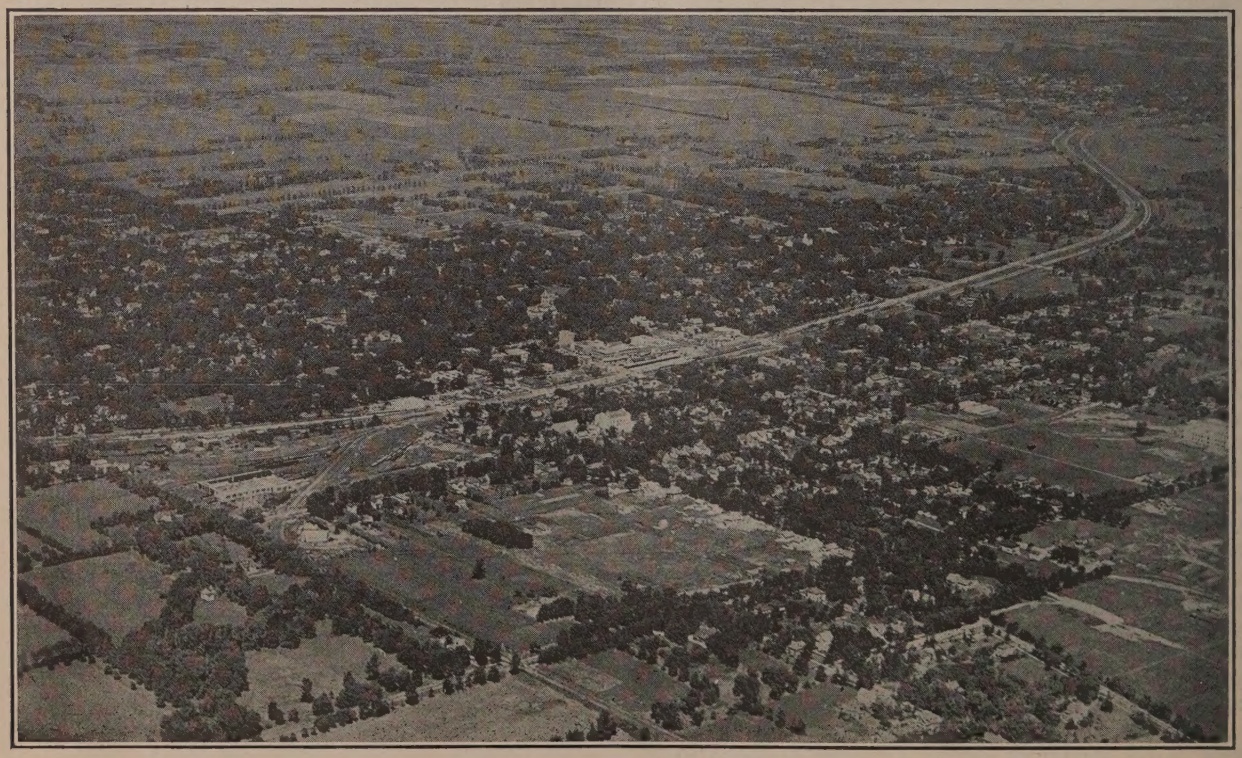
It is here that unusual care may well be exercised by the company, to make sure that the men do not feel they are being penalized. Two dollars less in pay a week is a very tangible thing. A reduction of two dollars in living costs is not so tangible. However, Mitten Management has been seeing eye to eye with its men for so long now in labor and wage-agreement matters that all such minor wrinkles will doubtless be ironed out without difficulty. A certain amount of educational work still remains to be done before the "market basket" plan has passed the test of time.



Scenes Along the Chicago, Aurora & Elgin Railroad Before and After Its Rehabilitation

ROTTED ties, low joints, poor alignment, light ballasting, and a luxuriant growth of weeds formerly were features of the Aurora-Elgin right-of-way as shown in the upper left and center pictures. From Wheaton to Chicago the track has been rehabilitated, using treated ties, limestone ballast and new 101-lb. rail on curves, presenting now the neat appearance shown in the upper right-hand picture. The towns along the line have grown greatly since the improvement to the railway until the entire section has become closely built up, as shown below in an airplane view of Wheaton and neighboring towns.



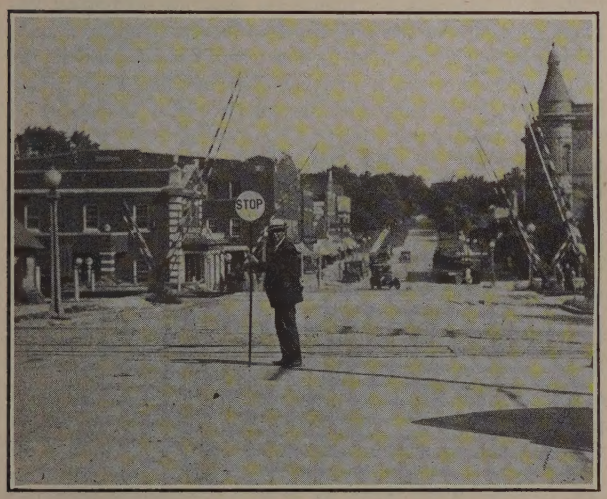


From Bankruptcy to Prosperity in Three Years

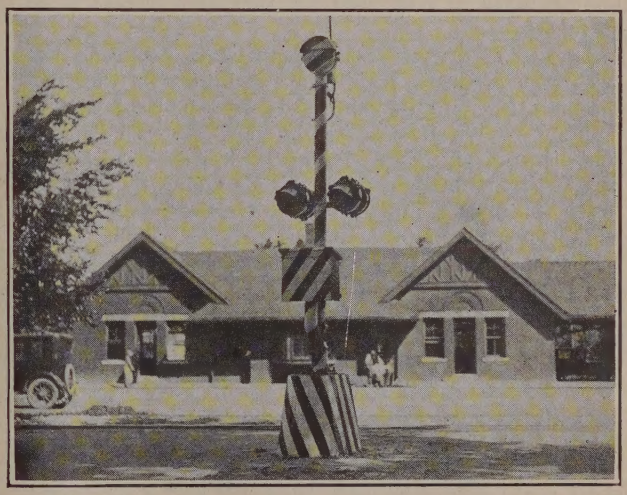
SECOND ARTICLE

Extensive Track Rehabilitation Program Carried Out by the Chicago, Aurora & Elgin Railroad—Substitution of Limestone for Gravel Ballast Has Reduced Maintenance Cost—Additional Crossing Protection Installed — Block Signals Protect Train Operation — Track Extensions Planned

IMMEDIATELY upon assuming control of the reorganized Chicago, Aurora & Elgin Railroad the new management inaugurated a comprehensive program for the rehabilitation of track. At that time the entire trackage of the system was ballasted with gravel, or gravel and cinders mixed. At the high speeds required to maintain schedules an excessive amount of track labor was needed, particularly in the fall, winter and spring months, to keep this track true to line and grade. Prior to the receivership the physical condition of the track had sunk to a low ebb. While considerable expenditures had been made by the receiver for the replacing of ties and the lining and surfacing of track, the result was far from satisfactory to the new management.



Method Formerly in General Use to Protect Grade Crossings on the Aurora-Elgin Line



Automatic Signals with Double Flashing Lights and Warning Bells Are Now Used at Many Locations

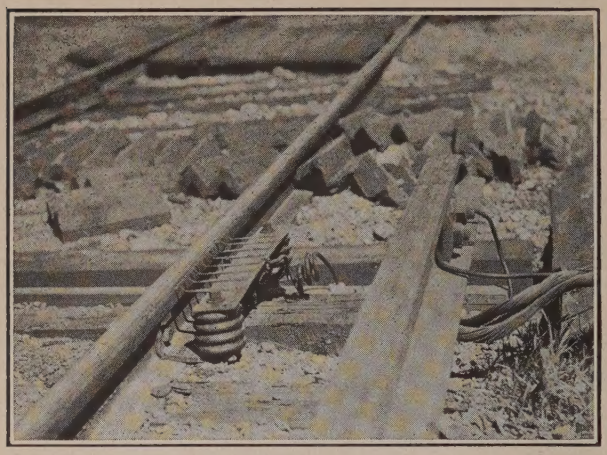
The first step was the ditching of the entire property with a steam ditcher, the material taken out being dumped upon the edges of fills, thereby increasing the factor of safety at these points. This served to drain the ballast and sub-grade, thus insuring a dry track. Through the cuts the ditches provide a place for snow removed from the track by plows.

For the ditching work a ⅝-cu.yd. Erie railroad ditcher was mounted on a flat car and coupled to a locomotive tender which supplied water and coal for the steam-driven ditching machine. Two 20-yd. air-operated dump cars were used to remove the material from one portion of the right-of-way and redistribute it at points where it was needed to increase the width of the shoulder. Over the 15 miles of right-of-way 25,000 cu.yd. of material was removed.

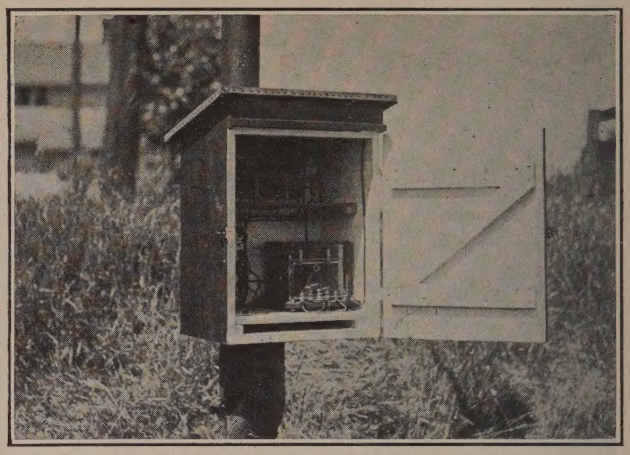
After careful examination it was found that the 80-lb. A. S. C. E. rail, some of which had been laid only ten years before, was in good condition and suitable for use for several years to come. This rail was in 60-ft. lengths with four-hole angle-bar joints. At the time of rehabilitation many of these joints were bent and some rail was badly worn under the head. Therefore, all joints in the sections of track which were rock-ballasted were replaced with four-hole continuous joints made by the Rail Joint Company. It was unnecessary to replace any of the rail on tangent tracks, except on the section between Laramie Avenue, Chicago, and Forest Park, over which the Chicago Rapid Transit Company has operated its elevated service for many years. This rail was entirely renewed with 101-lb. A. R. E. A. section, as was also most of the rail on curves.

Old ties were replaced with treated oak and white cedar ties, rail anchors being placed, eight to the rail length, opposite joints at centers and quarters of rails. These have eliminated the skewing of the ties at the joints and reduced the creeping of the rail with its subsequent bad effect upon track alignment.

Extensive trackwork was carried on between the hours of 8:30 a.m. and 4:30 p.m. due to the comparatively lighter schedule during this period of the day. To expedite the work three additional crossovers were laid, so that the average distance between crossovers would be 1½ miles. At the ends of each crossover a dispatcher's shanty was erected and the two booths connected by means of telephone. With these facilities



Contact on Running Rail for Operating Crossing Signals Is of the Progressive Finger Type



Cabinet on Pole Opposite Finger Contact Contains Relays and Mercury Tube Mechanism for Operating Flashing Signals

it was possible to handle all train movements in both directions over a single track without any delay. The total number of men used for this work varied from 75 to 110.

As a part of the track construction program, but somewhat separate from the rehabilitation work on the main line, sidings and yards were built at various points. At Wheaton a freight yard was constructed, consisting of six tracks having a total effective length of 3,366 ft. with the necessary leads and switches from the main line. This additional trackage was needed as a clearing yard for east-west carload freight, which constitutes a large portion of the freight business between Aurora, Elgin and Chicago.

In addition to the freight yards sidings were constructed both for passenger and freight service. At Elmhurst 640 ft. of additional track was built for two sidings having a total capacity of twelve cars. At Laramie Avenue, Chicago, five sidings having a total length of 1,830 ft. were constructed. This trackage was necessary in order to store passenger cars used in the short route service between Elmhurst and Wells Street Terminal, Chicago. Prior to the installation of these sidings, it was the practice to "deadhead" between Wheaton and Wells Street Terminal cars which were to be used in the evening rush hour. The sidings at Laramie eliminate all of this dead mileage and the increased car storage at Elmhurst allows for the installation of short-route service terminating at that town during the morning and evening rush hours.

Reballasting of the double track starting at the Des Plaines River and extending to Wheaton, a distance of 19 miles, was completed in the summer and fall of 1922. In 1925 the line from Wheaton to Elgin, a distance of 16 miles, was reballasted. First the track was skeletonized to the bottom of the tie and the material thus removed was used for widening the shoulders. With portions of the track in this condition, it was possible to scrutinize the ties and replace those which would not last for two years. This resulted in the renewal of an average of 900 ties per single-track mile.

Reballasting was done with limestone ballast in sizes 1 in. to 3 in., placed under and around the ties to the extent of 0.4 cu.yd. per foot of single track. After a length of track had been skeletonized, the first dump of new stone was made on one track, this dump being sufficient to raise the grade of the track 6 in. and do the tamping. On this first dump, 0.25 cu.yd. per single-track foot was deposited. During reconstruction and ballasting, single-track operation was put into effect between crossovers located approximately 1½ miles apart. It was the practice first to dump the initial quantity of ballast on one track, then after the track had been raised and the ties tamped to dump the first load of ballast on the other track following the same sequence of operation as on the first track. After the two tracks had been raised sufficiently to insure at least 6 in. of stone ballast under the ties, in addition to the old foundation of gravel ballast which remained undisturbed, the finished dump of rock ballast was made which brought the ballasting up to the top surface of the tie and completed the shoulder at the tie and the fill in the devil strip.

Rodgers center dump ballast cars were used for this work, while the tie tamping was accomplished by means of three Ingersoll-Rand pneumatic tie tampers of four-tool capacity each. The distribution of the rock ballast was accomplished by means of sixteen cars, which were operated in two trains of eight cars each. The limestone was secured from a quarry along the railroad right-of-way. It was the practice to take three trains of ballast per day from the quarry to the point on the right-of-way where the ballasting was being done. One motor car was used for this work, one train being filled at the quarry while the other was being delivered to the point of application.

Signals and Crossing Protection Installed

Extensive development of crossing protection and signal devices took place during the rehabilitation period, with the result that crossing accidents have been reduced to a minimum. A definite method of deciding when, where and how crossing protection should be installed was inaugurated and a standard form of crossing sign and signal have been adopted. A committee made up of five men determines the type and location of crossing signals and signs. From the committee's recommendation, the question of automatic protection or a watchman is decided. The type of protection depends upon the traffic at the crossing.

Where the majority of the traffic is pedestrian an automatic signal is installed, while at crossings where teams and automobiles are in the majority flashing red lights—in a few locations watchmen—are employed. The center installation consists of a single standard on

either side of the tracks with two flashing lights facing down the highway. A Nachod flashing relay causes the lights to flash alternately, giving a wigwag motion. The lights are in line with the driver's vision at a height of approximately 6 ft. 8 in. above the ground. The outfit is mounted on a concrete pier in order to prevent damage to the equipment by automobiles or vehicles. The apparatus is started by means of a contact relay, the initial circuit of which is closed by means of a Nachod brush contact operating on the running rail. This contact is located 2,500 ft. ahead of the crossing, which means that the signal is started approximately ½ minute ahead of a train traveling 60 m.p.h.

Where the roadway is not wide enough to accommodate the central position standard, a dual installation is also made, with the uprights mounted on the right side of the roadway facing against the direction of travel on either side of the right-of-way. The shaded projector-type lamps used in these signals contain one 36-watt concentrated filament lamp behind each red lens. These are operated directly on the 600-volt railway circuit.

In addition to these automatic flashing lights, appropriate wooden signs have been designed with a view toward cautioning the motorists and pedestrians relative to unprotected crossings in the country. These signs have a white background and are lettered in red and give exact information relative to the crossing being approached by the person on the highway. These standard types of crossing signs are being installed throughout the entire system in the hope that the motorist or pedestrian will familiarize himself with the type of sign and its meaning, and will take greater care in crossing the right-of-way.

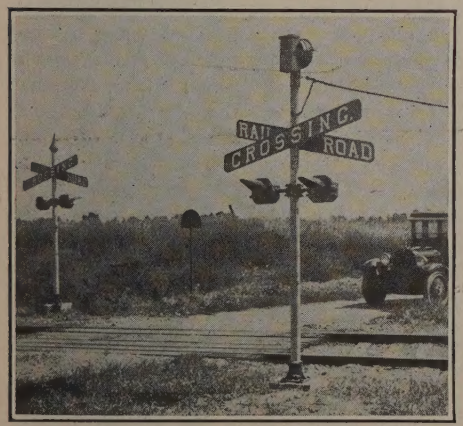
Train Operation Protected by Block Signals

Block signals for governing train operation are of the color-light type made by the Union Switch & Signal Company. Work is practically finished on complete protection of the main line from Chicago to Villa Park by means of automatic block signals, spaced one every mile on tangent track and as close as necessary on curves. For the operation of these signals a 110-volt, 60-cycle circuit is used, which is further stepped down to 18 volts for use on the track circuit. This energy is supplied from three of the substations, it being reduced from 26,400 volts to 2,300 volts at the stations for signal distribution, and further reduced at the points of application by means of transformers. This type of color-light signal is being adopted as standard in place of the semaphore type because of its greater reliability, elimination of mechanical difficulties, its greater visibility, and its reduced maintenance cost. A signal consists of a two position board with green and red lenses illuminated by a 36-watt concentrated filament lamp. Where three-position signalizing is desired a yellow lens is added. An illustration of one of these installations on a curve is shown. For the track circuit used in conjunction with the automatic signal special heavy-capacity impedance bonds are used, allowing both rails to be used as the return feeder circuit for the power line. This arrangement calls for careful bonding at crossovers and switch points to insure the efficient operation of the system.

Track Extensions Planned

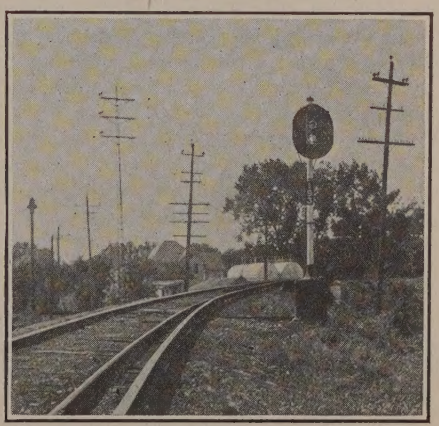
Last summer interests associated with the railroad purchased 2,000 acres of land south of the Aurora-Elgin line at Bellwood, and immediately thereafter, with the approval of the Illinois Commerce Commission, organized the Chicago, Westchester & Western Railroad. They then built a branch line from the Aurora-Elgin line at Bellwood south to a point near Roosevelt Road, opening up this new area for suburban development. In November, 1925, this syndicate sold its real estate holdings to two of the largest suburban operators in Chicago. The latter are planning to open up this area for subdivision in the spring of 1926. A contract was made in the summer of 1925 by which the Chicago Rapid Transit Company will extend its elevated operation westwardly over the tracks of the Aurora-Elgin line from Forest Park to Bellwood, and thence over the new line to the Roosevelt Road Terminal, the Elevated taking over in connection therewith the handling of the local service for the two easternmost suburbs on the Aurora-Elgin line, viz., Maywood and Bellwood.

The purpose of the construction of the Chicago, Westchester & Western Railroad was to provide at this time —before the subdivision of the area adjacent to the main line of the Aurora-Elgin made this step impossible at any reasonable cost—the provision of a right-of-way which would enable the Chicago, Aurora & Elgin Railroad later to build a line opening up the territory lying between its main line and the line of the Chicago, Burlington & Quincy some miles to the south.



Double Semaphore Type Signals Are Used on Narrow Roads, One on Each Side of the Track

Minor Grade Crossings Are Protected by Warning Signs of This Type



Color-Light Signals Adopted as Standard on Account of Their Reliability and Low Maintenance Cost

Zanesville's Experience with New Cars Eminently Satisfactory

Despite Falling Off in Gross Due to Industrial Conditions in This Ohio City, the New Cars Have Made Possible Savings that Have Increased the Net $24,000 in the First Year of Their Operation

Christmas Parade of 20 New Cars Being Brought into Zanesville, Ohio

During the year covered by this story the Columbus, Newark & Zanesville Electric Railway emerged from receivership and is now known as the Southern Ohio Public Service Company. The parade occurred Nov. 28, 1924, and the cars were placed in operation during December of that year with results that have been extremely gratifying.

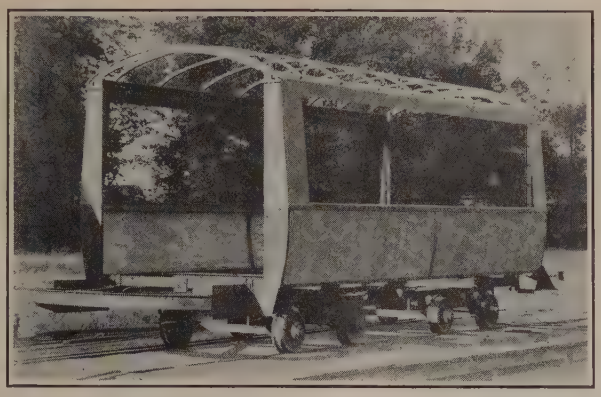
SAVINGS made possible by the operation of 20 new cars by the Southern Ohio Public Service Company have helped materially to reduce the total operating expense more than $48,000. Despite the unfavorable industrial conditions existing in the territory surrounding Zanesville, Ohio, the net savings have been increased more than $24,000 during the year in the face of a loss of revenue of a like amount equaling 10.4 per cent of the total revenue of the company for the year 1924.

These results are for the Zanesville city division of the railway. That city was the extreme eastern terminus of the 550-mile Ohio Electric Railway system, which was broken up into its component parts following the receivership. The Columbus, Newark & Zanesville Electric Railway, forerunner of the present company, comprises the interurban line connecting those three cities, the city lines in Newark and Zanesville and the light and power business in the latter. It has had a hectic career, having been in receivership twice, the last time emerging during 1924 on a reorganized basis as the Southern Ohio Public Service Company. Despite these changes, the statements of the operating costs of the Zanesville city division have been comparable while this road has been under the supervision of Day & Zimmermann, Inc., since 1919.

As the result of progressive management many troubles leading up to the reorganization in 1924 have been overcome and the gratifying results shown by the first year's operation of these new cars made possible. Zanesville had such poor cars and such poor service prior to Day & Zimmermann's entrance on the property that the city fathers naturally distrusted the company regardless of its management. Finally, after much effort on the part of R. Z. Zimmermann, general manager, a new franchise was obtained on the basis that the company would rehabilitate its property and improve its service. A few months after the agreement was signed with the city 20 new cars were rolled into Zanesville in a parade, as illustrated above. Shortly afterward these cars were put into operation. Seven of the old cars were remodeled and equipped with air brakes for use as rush-hour trippers and for heavy loads caused by emergency conditions, but essentially the entire schedule is filled by the new cars.

The financial story copied from the twelve months operating statement of 1924 and 1925 is shown in the table on page 397.

The way and structures maintenance account has been reduced $5,000. This is largely accounted for by the new trackwork completed by the company during the year, the actual rehabilitating charges being paid out of the special fund raised in connection with the reorganization. The equipment maintenance shows more than $11,000 reduction. It can be entirely attributed to the new cars. The power expense has been reduced from $46,934 to $33,233. For the year 1925 there has been an increase in car-miles operated, and despite this the power expense has been decreased. The increase in car-miles is reflected in the conducting transportation charge, which has increased since more man-hours are required. Traffic expenses have been increased because of more advertising and more public relations work accomplished. The total operating expense of all accounts, however, has been reduced $48,897, or 21.25 per cent. Only half of this gratifying saving found its way into the net earnings, the other half being absorbed in the loss of revenue as compared with 1924, which is accounted for by the decreased industrial activities last year.



Sturdy Body Construction of the 20 Cars for Zanesville, Ohio

The floor and framework of the body are of steel, the side panels being of Plymetl, mounted in two sections, joined in the middle with a batten strip front and back, riveted with ¼-in. hot rivets. The roof carlines are of pressed steel channels which support the Haskelite sections, molded to shape in the factory.

TABLE I—OPERATING STATEMENT FOR YEARS 1924 AND 1925, BEFORE AND AFTER INSTALLATION OF 20 NEW CARS AT ZANESVILLE, OHIO

Revenue:	1924	1925	Decrease	Per Cent
Passenger revenue	$235,406.00	$208,875.00		
Revenue from other operations	1,393.00	3,214.00		
Total revenue	$236,799.00	$212,089.00	$247.10	10.4
Operating Expenses:				
Way and structures	$15,093.00	$10,422.00		
Equipment	19,720.00	8,148.00		
Power	46,934.00	33,233.00		
Conducting transportation	93,997.00	99,664.00		
Traffic	1,856.00	4,432.00		
General and miscellaneous	52,680.00	25,484.00		
Total operating expense	$230,280.00	$181,383.00	$438.97	21.25
Net earnings from operation	$6,519.00	$30,706.00	$24,187.00 Increase	370
Operating ratio	97.25	85.52		
Statistics:				
Miles of track operated	12.78	14.27		
Car-miles operated	785,934	814,839		
Revenue passengers carried	4,043,330	3,492,325		
Revenue per car-mile	29.95	25.63		
Kilowatt-hours per car-mile (at switchboard)	4.71	3.00		

Much has been said recently in favor of double-truck rather than single-truck cars. It must be remembered, however, that Zanesville is a city of slightly less than 30,000 population and early studies of traffic indicated that it was in the interests of better service to provide shorter headways with single-truck cars rather than longer headways and larger cars.

The character of the cars can be seen from the illustrations, showing both the exterior and the interior of these units. The car framing is of steel, 8 ft. 6 in. wide at the belt rail, the body being 30 ft. in length. The side framing curves inwardly 3 in. on each side from the belt rail to the floor sills. Above the belt rail the window posts slope into the letterboard 3 in. on each side. Plymetl side panels are used, molded in the curved form seen. Each side panel consists of two sections, being joined together in the middle by the use of battens which are hot-riveted to the plates. The roof is constructed of three-ply Haskelite panels and supported by pressed steel carlines. These are best seen in the view of the skeleton car. The inside of the channel is

Interior of One of the 20 Zanesville Cars Showing the Wide Aisles and the Ample Seats.

Built with full spring construction and covered with a taupe-colored high-grade plush dyed especially for these cars. There is no clash of color to offend the eye in the interior decorations.

Front End of One of the Zanesville Cars Constructed by the G. C. Kuhlman Car Company

Bodies are painted a yellowish cream. Note the special red bullseye that lights when doors are opened to warn approaching autoists.

fitted with a wood filler which is riveted to the base of the channel. The Haskelite sections of the roof are then screwed firmly to the wood filler and covered with canvas in the usual manner. The electrical and air brake equipment is of General Electric design and manufacture, two 25-hp. motors being used with standard K type control. Full safety devices are used with air-operated National Pneumatic door mechanisms.

The cars are operated by one man and designed to use either the front entrance for simultaneous loading and discharging or front entrance rear exit. This latter type of operation is used in the business district to avoid front-end congestion. In the outlying districts the front-entrance-and-exit plan of operation is used exclusively. The rear door can be controlled by a separate valve from the motorman's position. Two rear-vision mirrors are used, one inside and one outside the vestibule.

TABLE II—DETAILS OF EQUIPMENT EXPENDITURES IN ZANESVILLE, YEAR 1924 BEFORE THE NEW CARS COMPARED WITH 1925 AFTER THE NEW CARS WERE INSTALLED

	1924	1925
Superintendence of equipment	$94	$294
Passenger cars	10,966	5,430
Service equipment	67	86
Electrical equipment of cars	6,460	1,830
Shop equipment	.....	56
Shop expenses	1,546	452
Other operations	587	.....
Total equipment	$19,720	$8,148

Saving in equipment cost $11,572 or 58.6 per cent.

One five-light circuit is used with four lamps in the body of the car, the fifth being the headlight. These fixtures were manufactured by the Electric Service Supplies Company and are equipped with individual cut-outs mounted in a panel over one vestibule. In case of a burn-out, only one of the main body lights will go out at a time. A second series of five smaller lamps is used to illuminate the platform, steps, signs, etc. As will be seen in the exterior view, an auxiliary lamp mounted on the dash is arranged to light whenever any of the doors are open. This is the sixth lamp in a series, which is cut in or out by a switch on the door engine. Whenever a door is open this light shines out to the rear through a red bullseye and warns approaching motorists that the car is taking on or discharging passengers.

Both seats and backs are of spring construction and are covered with a taupe plush of pleasing design which harmonizes with the interior finish. They are of Hale & Kilburn manufacture. The seat centers correspond to the post centers of 32 in. and give ample knee room for passengers.

Floors are flush with the platforms and are covered with battleship linoleum, which is cemented to double wood floors with hot glue to avoid buckling. The single step between the street and the platform is recessed, the folding doors protecting the step when in the closed position. This arrangement has certain advantages over the folding step in being more rigid and is protected from the weather. It is less liable to be damaged due to minor collisions with vehicles on the street.

Sales Language Used on Car Cards of the Toronto Transportation Commission

MESSAGES to the public couched in sales language, instead of the formal and often arbitrary wording common in the past, are used by the Toronto Transportation Commission. Cards are carried in frames suspended from the car ceilings. Sometimes the same message appears on both sides and sometimes there is a different story on each side. Some of the subjects treated are shown in the accompanying illustrations and others are summarized below:

"Shopping Convenience," showing shoppers using the attractive cars of the Toronto Transportation Commission.

"Picnic in Toronto," reminds the rider that there are wonderful playgrounds right at home. The other side of this placard told about "A Hidden Gem," Sherwood Park, Toronto.

"Attractive Toronto" urges Torontonians to write their out-of-town friends why Toronto's bathing, boating and beach attractions make it a fine summer resort. The other side, headed "Broadcast Toronto," continues the message.

Finally, there is a message about the T. T. C. Gray Line motor coach tours, with the specific suggestion to try an evening tour to Sunnyside and the Humber; another message on the opposite side mentions that a beautiful 10-mile lake shore drive is available for 50 cents, round trip, with stop-over included. This message, by the way, is a reminder that the Toronto Transportation Commission not only conducts a trolley and associated motor bus service at trolley fares but is also in the de luxe coach business for both regular and chartered services.

Toboggans may be Rented at the Slides

Join carefree youth either as spectators or playmates. Take a T.T.C. car to High Park or Riverdale Park and enjoy the thrills and spills of winter sport.

THE SALESMAN'S CAR

City Salesmen are coming back to their "old reliable"—the street car.

It takes them close to their downtown calls and leaves their minds free of annoying parking problems.

Save time by Street Car

YOUR CHAUFFEUR

¶ Comfortable T. T. C. cars take you right to and from the theatre door. The motorman will look after the car while you enjoy yourself with a mind at ease.

TO OUR VISITORS

You can travel conveniently to any place in Toronto for one fare.

Just get on the nearest street car and ASK THE CONDUCTOR.

He will direct you and give you a transfer, if necessary, without extra charge.

16 TRIPS $1

Messages to the Car-Riding Public in Toronto Are Worded in Sales Language

CO-OPERATE

Street cars carry 80% of the people daily transported to and from the downtown area of the city. The majority of vehicles carrying the remaining 20% also use car line streets.

Co-operation and support of regulations to improve traffic movement on these streets are good for all.

Depreciation as an Operating Expense

SECOND ARTICLE

Determination of the Reserve—Replacement vs. Retirement as the Basis of Calculating Charges—Comparison of Separate Funds for Various Elements with a General Fund — What Is Average Life?

By W. H. Maltbie
Late General Counsel United Railways & Electric Company of Baltimore

SOME months ago, as the result of a conversation with one of the editors of this paper, the author undertook to prepare a series of articles on the subject of depreciation. This series was looked forward to with great interest, as Mr. Maltbie was an outstanding authority on the subjects of valuation and depreciation. After his death, the manuscript was located and forwarded to this paper through the kindness of J. H. Hanna, chairman of the A.E.R.A. committee on national relations sub-committee on depreciation, of which Mr. Maltbie was a member.

These articles were written from the viewpoint of the present investigation by the Interstate Commerce Commission of the whole subject of depreciation of electric railway property. This investigation was undertaken with a view to establishing definite rules and regulations covering the allowance of charges for depreciation as an operating expense on all roads subject to its jurisdiction. Since there is a possibility that any regulations of this sort established by the I. C. C. may be accepted as a precedent by various state commissions it is important that all street railway executives should be familiar with the present situation.

These three articles, dealing respectively with causes of depreciation, methods of setting up funds to provide for depreciation and practical methods of building up a retirement reserve, constitute a valuable contribution to the literature on the subject. They were probably the last creative work of the author.—EDITOR.

THE second point to be considered in the problem of depreciation is the question as to how large the reserve shall be, and the answer to the question depends upon the purpose for which the reserve is accumulated.

Students of the subject are divided into two schools. The first school holds that the reserve is intended merely to refund to the investor the amount of his investment when the property is outworn. If the replacing property costs more, the investor is supposed to furnish more capital; if it costs less, he has free capital which he may withdraw from the investment. The other school holds that the sum to be accumulated should be sufficient to purchase a duplicate unit of equipment. The first school maintains the investment, the second school maintains the plant. The first school builds a retirement reserve, the second a replacement reserve. The first school, knowing the cost of the unit of property, must estimate the amount of salvage which can be secured at the time of its retirement. The second school must estimate not only the amount of probable salvage but also the probable cost of replacement. It is evident, therefore, that while neither school can be positive as to the definite figure which must be accumulated in the reserve, the estimate for a replacement reserve is of necessity less definite than that for a retirement reserve.

The estimated value of salvage is usually but a small proportion of the total cost of the unit of property and therefore an error in this is not of vital importance. It is true that during the World War value recovered for salvage was frequently much greater than had been anticipated and in some cases greater than the total original cost of the property retired. But this variation yielded an excess sum, and therefore did not create any financial embarrassment.

For the replacement reserve, however, it is necessary to estimate in advance the cost of the new replacing unit of property. For short life property in a period when economic conditions have brought about a well-defined unit cost trend such a prophecy may be reasonably accurate, but for long life property, or for all properties in periods of rapid economic change, such prophecies are practically worthless, and the amount of the depreciation reserve must be changed frequently, or even from year to year as the replacement cost changes. Consider, for example, a single unit of property whose replacement cost has followed the index number for metals and metal products of the United States Bureau of Labor statistics. Assume an investment made Jan. 1, 1913, in entirely depreciable property, of $100,000, with a 20-year life. Then in the accumulation of a retirement reserve there will be a charge against operation of $5,000 per year. If it is desired, however, to accumulate a replacement reserve, the amount which should be in the reserve fluctuates in accordance with the following table:

Year	Index	Proper Reserve	Necessary Contribution
1913	100	$5,000	$5,000
1914	85	8,500	3,500
1915	99	14,850	6,350
1916	162	32,400	17,500
1917	231	57,750	25,350

It is obvious that it is not possible to plan practically for a reserve which must meet such sharp variations.

If, however, we are dealing not with a single unit of property, but with a large aggregate of units of different classes and types, it is possible to meet this objection against the replacement reserve.

The amount of the reserve is affected somewhat by the anticipated reason for the retirement of the prop-

erty, since this reason may have a direct effect upon the salvage value to be recovered. Thus a company engaged entirely in interurban service may anticipate the retirement of cars on account of their inadequate carrying capacity, and consequently give them a short life with a relatively high salvage value as the amount to be realized on resale, while a company doing a more diversified business would plan to shift these cars from an interurban branch to urban service if they became inadequate for interurban service, and would consequently make no allowance for salvage other than scrap or junk value.

Length of Future Life

It is not sufficient, however, to know merely the total reserve which should be accumulated by the time the equipment is to be retired. It is necessary to know the annual appropriation to the reserve. This demands knowledge at the beginning as to the number of years during which the unit of property will be in service.

It is obvious, first of all, that there is no possible way of determining with any certainty the future life of an individual unit of property, and that any estimate made must be in many cases nothing more than a guess.

For the owner of a single piece of equipment, such, for example, as a single car, this problem of determining the future life of the car is of vital importance. He must estimate its life before it wears out, which, assuming proper maintenance, will be a long term of years. He must also estimate the length of time until it becomes obsolete, which will probably be a shorter term, and he must also estimate the length of time until it becomes inadequate, which may be a still shorter term. Then, if he wishes to play safe, he must adopt as his life period the shortest one of the three. Moreover, since he is dealing with a single unit, he is not helped particularly by any knowledge of average life. If, for example, he knew that in the past history of the property with which he was connected the average life until inadequacy had been ten years, and he therefore estimates ten years as the life of the one unit with which he is now dealing, he is simply taking even chances on losing money, since there will be as many instances of inadequacy below the average as above. His only safe method is to use the minimum life term and not the average. In other words, if an executive is dealing with a single unit and desires to play safe he should accumulate its retirement cost in the minimum life which can be reasonably anticipated, and even then he is taking his chances against retirement through non-insurable accidents within a still shorter period.

Unit, Class or General Reserve?

When, however, we cease to deal with a single unit and deal with an aggregate of units, either all of the same class, or of different classes, a number of new problems arise.

The first and most important question to settle is whether we will set up a reserve for each individual unit of property, a reserve for all units of a given class or a general reserve to be used for retirements of any property belonging to the company.

If we decide to set up a reserve for each unit of property then the appropriation to that reserve must stop whenever the unit is retired from service, or, if it should overlive its estimated life, at the expiration of the estimated life. The result of this system is a deficit on short-lived property which must be charged to operation or to surplus. If it were possible to charge it to operation, the result would be that the users of that particular year would pay not only their share of the original cost of the article, but also the deficit in the payments of the users of the preceding years, and therefore one of the primary objects of the accumulation of a depreciation reserve, the equalization of cost to users of successive years, is destroyed. Moreover, it is practically impossible to charge this deficit against operation because rates of fare cannot be raised and lowered on account of unexpected retirements. The consequence is that the actual cost is charged against the owner of the property, either by being charged against his accumulated surplus or by increasing operating expense and decreasing his return for the year in question. In consequence the owner loses the protection which the accumulation of the reserve was designed to give him, namely, the protection of his right to collect from the users of his service not only the cost of operating but the cost of the equipment worn out in service.

Nor has the owner any chance to recoup this loss, for while the number of years of life beyond the average may equal the number of years of life less than the average, the reserve for the individual unit cannot justly receive any appropriation after it contains the full retirement cost. Therefore there can be no appropriation to any unit reserve in excess of the original cost of the unit, and therefore nothing wherewith to balance the owner's loss on the short-lived unit. To make the matter more specific, assume that two cars are purchased and given an estimated life of 20 years, and that one of them lasts for eighteen and the other for 22 years. Assume, moreover, that the depreciable value of the cars is $10,000 each, so that the annual appropriation for depreciation is $500. When the first car goes out of service at the end of eighteen years there will only be $9,000 in its reserve. No more can be charged in its reserve, because it is no longer in existence. The $1,000 must therefore be charged either in its last year, which is impossible, since rates cannot be changed, or must be charged against the owner and taken as a loss. At the end of the twentieth year the second car will have the full $10,000 in its reserve and no more can be charged against it. If rates are adjusted so as to pay only the depreciation appropriation and a fair return, the users of this car in the 21st and 22d years are having a part of their service paid for by the users who contributed the deficit in the eighteenth year. If, on the other hand, the rates are left unchanged both in the eighteenth and 21st and 22d years, the owner has a chance in the 21st and 22d years to recoup the thousand-dollar loss incurred in the eighteenth year, but it will come to him not as a recognized recoupment, but as an apparent excess over a fair return, and, if of sufficient magnitude, may lead to a public demand for reduction of charges.

So long as an individual reserve is set up for each unit of equipment or other property it is evident that the owner must protect himself by using, as in the case of the owner who owns a single unit, a minimum rather than any average life. If, however, the reserve is set up for groups of units, conditions change. Consider, for example, the case of a road having just purchased a lot of 100 cars of the same model. If instead of setting up 100 separate reserves, one for each car, a

single reserve is set up for the 100 cars, it is possible, so far as the influence of wear and non-insurable accident is concerned, to use an average figure, realizing that the longer-lived units of equipment will make good any deficits created by the passing out of the short-lived units. But, so far as obsolescence and inadequacy is concerned, these cars, if they go out at all, will go out together, and therefore the minimum life period must be adopted in order to protect the owner against these dangers. If, however, as is frequently the case, this company owns not only these cars but many others of other designs and models, and carries a single reserve for its rolling stock, there is less danger of it all going out at one time through either obsolescence or inadequacy, and average figures may be used with the expectation that those patterns or models which exceed the average life will make good the deficits created by those which do not reach the average.

If we go a step farther and set up a single reserve for the entire property, it becomes possible to minimize still further the influence of obsolescence and inadequacy on our life periods. If our cars become obsolete earlier than we anticipate there is a chance that our power plant, our boilers, our substation equipment will exceed our estimated life.

The whole situation seems to boil down to this: There will always be cases in which individual units go out earlier than is anticipated. If a reserve is created for the individual unit, this means a loss, but if a reserve is created for a group, the broader and more diversified the members of that group, the better chance there is of recouping through excess life the deficits created by short life.

Average Lives

But this possibility of extending the life term rests upon our ability to determine an average life, and doing business on a basis of averages is extremely dangerous unless certain fundamental scientific principles are strictly observed.

The first of these is that the averages used must be deduced from a sufficiently large number of definitely reported instances to eliminate the influence of individual cases or even the influence of sub-groups. If you were trying, for example, to determine for the first time the average human life, there would be no better way than to record the age at death of all reported deaths. The average at the end of the first ten entries may be anything from two or three years up to eighty or more. The tenth entry may make a marked change in your average, the hundredth entry a much smaller one, the thousandth entry, by itself, would not make any appreciable change in the average, but you may at this point run into the deaths of a different group or a different community, or the results of some accident or epidemic, and find an appreciable change. You finally reach, however, a point where your average is practically unchanged, whether you add a single entry, or a thousand, or a million. Whenever this point of sound average is reached, it is safe to use it as the basis of financial transactions, provided the second fundamental principle is observed.

The second fundamental principle is that financial transactions may not be based upon the sound average deduced as above unless it is applied to a group large enough to yield of itself a sound average. Thus if the study of a million cases leads to an average life expectancy of 30 years, it is not safe, therefore, to insure a single individual, or ten individuals, or a hundred individuals upon that basis; but an examination of the data will show that it is possible to determine a smaller group, which selected at random from the larger group will yield approximately the same average. An insurance company will then plan its business with a view of spreading its risk over the number of lives, as a minimum, in this smaller group and over sufficient territory to bring into play all of the occupations and conditions which entered into the original estimate (unless, of course, it attempts to eliminate some of those which tend to shorten life).

Now, unfortunately, neither of these conditions can be met in studying the life of electric railway property. Retirements and ages at retirement have not been recorded, so that there exists no sound average life on which to base financial transactions, and therefore the first cannot now be met.

Determination of Useful Average Life Hopeless

The hope of some time determining definite life tables upon which general depreciation ratios may be set up, although still held by theoretical students of the question, receives but little encouragement from practical men in the street railway industry. The American Electric Railway Engineering Association attempted the problem in 1911, but after careful study pronounced it hopeless, and abandoned it, and a joint committee of the Engineering and Accounting Associations reached the same conclusion and requested to be excused from further consideration of the subject in 1925.

The reasons for this conclusion are comparatively simple and are perhaps best understood by considering special illustrations. Consider track. The life of the tie is a question of decay and not at all a question of amount of use. Decay itself is a question of the quality of the original tie and of the character of the base in which it is imbedded. The latter varies from property to property and from point to point on the same property. The former varies from property to property and from tie to tie on the same property. The life of the rail is almost entirely a question of wear, complicated in some cases by corrosion of the rail base. The amount of wear is a question not of years, but of car movements and, in the case of rail in paved streets, of other vehicular movement as well. Car movements vary from point to point upon the same property and change from year to year at the same point with the readjustment of traffic in a way that cannot be definitely predicted. Other vehicular movement cannot be predicted at all, and the gradual disappearance of the iron-tired vehicle from city streets and to a certain extent the modern bonding of track probably vitiate the entire previous experience.

The life of a car is a question of maintenance, not only of the car itself, but of the track over which it runs, of the weather conditions under which it operates and of the extent to which its motors are subjected to overload, while obsolescence, which no man can predict with any certainty, and inadequacy, which is a purely local phenomenon, equally uncertain, are probably much more important than mere wear.

But even if the data were available and the sound average had been computed, it could not be applied to the property of any particular company, since the number of units operated by that company will be relatively small and all of them subject to the same set of local conditions which modify service life and which

have been eliminated or minimized in the sound average. If, for example, the data were available, were collected and digested, and showed a sound average life for rolling stock of 25 years, that information would not form a satisfactory basis for a depreciation reserve for company A, which recently wrote me that in its judgment every car became obsolete after fifteen years of service and should be retired, or for company B, which wrote me that it was rebuilding cars already in operation for over 20 years and anticipated drawing from 20 to 25 years additional service out of them before they were again put through the rebuilding process.

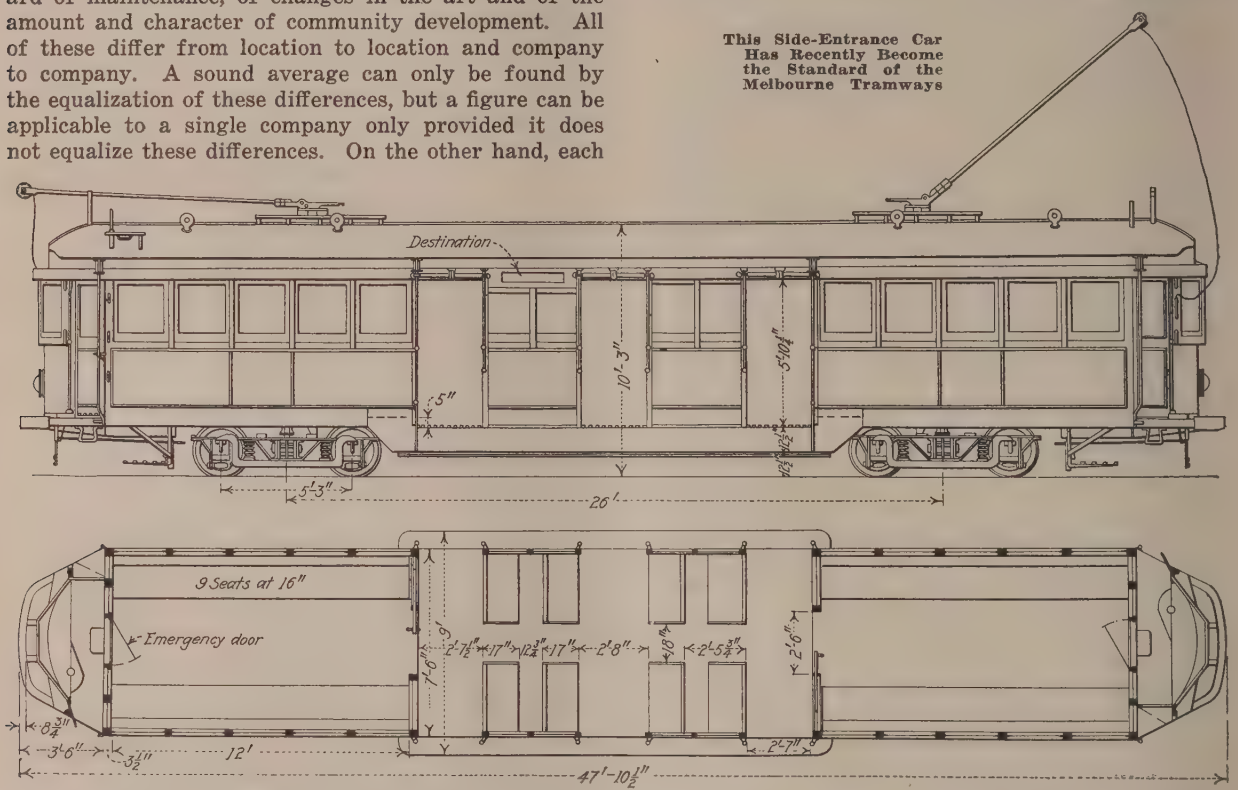
The life of any particular unit of equipment is, as noted above, in greater or less degree a function of climatic condition, of the amount of use, of the standard of maintenance, of changes in the art and of the amount and character of community development. All of these differ from location to location and company to company. A sound average can only be found by the equalization of these differences, but a figure can be applicable to a single company only provided it does not equalize these differences. On the other hand, each of these elements, excepting possibly climatic conditions, changes from decade to decade for an individual company, and therefore the experience of the individual company, in addition to covering too small a number of illustrations, is, by the possibility of a change in the very elements which determine the length of life, made an unsafe basis for financial transactions.

New Promotion System in Vogue in Los Angeles

EXAMINATION of the 114 men who were tentatively appointed as line instructors under the new promotion system of the Los Angeles Railway, Los Angeles, Cal., was conducted recently by Dan Healy, chief instructor. The examination covered the general rules for motormen and conductors which were compiled and given to the instructors in printed form on Nov. 1. They were given 30 days to study the points that must be drilled into the minds of new men. About 40 men were called into the instruction department at a time. The examination was conducted orally by Mr. Healy, and time was allowed for discussion of points on which there was a difference of opinion. Mr. Healy said he was highly pleased with the way the line instructors have learned the essential points of their work and predicted that very few would fall down on the examination.

Melbourne Adopts Three-Door Car as Standard

MULTI-SIDE DOOR cross-bench cars are no longer standard on the Melbourne Tramways. It has adopted a center entrance and exit car with three doors at the center on each side. Several of these cars are now in service and have proved satisfactory. A feature of the car is that the side entrances are not equipped with doors. The mild climate of Melbourne in winter makes it unnecessary for protection against the weather, and the experience with these cars indicates that doors were not necessary to prevent accidents in boarding and alighting.



This Side-Entrance Car Has Recently Become the Standard of the Melbourne Tramways

There are, however, bulkhead doors at the entrance to the end compartment, which seat eight on each side or sixteen to the compartment. The total seating capacity of the car is 52. The car is equipped with 26-in. wheels and four motors, one on each axle. The weight of the car empty is 17.11 tons.

A number of the main dimensions of the car are shown in the accompanying drawing, which is from the *Electrical Engineer of Australia and New Zealand.*

The electric railway system in Melbourne consists of about 160 single-track miles, covering about 90 route-miles. About 27 single-track miles will be added during the next twelve months.

Double-Deck Tramcars in the Shopping District of Johannesburg. The Center Poles Shown Have Now Been Removed

Tramway Operation Progressive in the Witwatersrand

Johannesburg Has Double-Deck Car Bodies on American Underframes—Schedule Speed Is High—Competition of Privately Owned Buses Has Been Serious, but Is Now Being Met by Operation of Tramway-Owned Buses

By M. Edward

JOHANNESBURG, the central city of the Witwatersrand, has what is claimed to be the largest electric railway system operating double-deck cars in the Southern Hemisphere. The whole of the Witwatersrand, that famous 60-mile strip of gold-bearing reef in the Transvaal, has proved itself the most progressive part of the Union of South Africa, particularly in the mechanical field. Johannesburg has a black and white population of about 300,000 in a municipal area with a 6-mile radius. As the cars are only run for the benefit of the white population, the system caters to approximately 160,000 people in a comparatively large area.

Substitution of electricity for horse power was begun in 1906, the municipality buying out the company then operating the horse cars. Politics has not played much part in the management of the system, which is vested in a committee that operates it on entirely business lines. Most of the street cars in South African cities are operated by the municipalities, the exceptions being in Cape Town, Port Elizabeth and Kimberley. These company-operated tramways are not as large as the Johannesburg municipal system. There is a trend in South Africa toward state and municipal ownership of large public enterprises. For instance, the railways are owned and operated by the government, as are the telephones and telegraphs, and in practically every city and town the power stations are municipal property.

Power-generating facilities in Johannesburg are also municipally owned. In the operation of the street cars only the actual cost of electricity supplied is charged against them, no overhead being included.

From the beginning double-deck cars have been used in Johannesburg, the system being modeled on the English plan. Originally the city of Glasgow, which is famous throughout the British Empire for its tramways, was looked to for guidance. Now, however, a system peculiar to the needs of Johannesburg has evolved. More than 90 per cent of the 135 English-built cars brought out in the first few years are still in operation. The first bodies were built in Great Britain and only assembled in South Africa. Today it is the practice to build the bodies locally and large shops have been constructed for this purpose. During the past few years more than 60 American double-truck underframes have been bought from the J. G. Brill Company and extraordinarily good-looking 75-80-passenger double-deck bodies have been built on them in Johannesburg. Most of these cars are equipped with four 50-hp. motors, while some have four 35-hp. motors. Of the English-built cars only twenty are of the double-truck or "bogie" type, but even the original small four-wheel double-decker can seat more than 60 passengers and has given excellent service in spite of consistent overloading.

Single-deck cars are by no means rare in South

Africa, as they are used in Kimberley and Pretoria exclusively and in Cape Town and Port Elizabeth in conjunction with double-deckers. It was only in 1925, however, that Johannesburg citizens first saw a single-deck car on their tracks. The double-deck cars have proved satisfactory for city and suburban traffic in Johannesburg, but the tramway committee has now decided to try out a number of small four-wheel single-deckers, the bodies being built locally on some of the original underframes first brought out for use as double-deckers. These small cars seat only about 30 passengers and they are used mostly during the slack periods of the day. It is said that they are proving successful and are saving power when small loads are to be handled.

When the traffic is heavy the double-deckers are used, supplemented by single-deck cars run alternately with

Electric Tower Truck of the Johannesburg Municipal Tramways. Gasoline Trucks Also Are Used

them. This is practically a "car-and-a-half" system and its use is said to be due to the competition of privately owned motor buses, which have assailed the Municipal Tramways in practically every section. More than 50 miles of route are operated by the tramways and the total trackage is 80 miles. This is being extended, but it is thought that the 100-mile mark will hardly be reached in view of the change of policy necessitated by the motor bus competition.

Fighting Privately Owned Lines

A bitter war has been in progress during the past three years and it now appears to be reaching its final stages. The municipality had it in its power, of course, seriously to hamper privately operated motor buses, but public opinion was too strong and consequently the war was waged with perhaps more restraint than had the cars been owned by a company. As far back as 1912 petrol-electric buses were used as feeders by the Municipal Tramways, but they were discontinued when further sections of track had been laid. The manager of the tramways has long advocated buses as being necessary to co-operate with the street cars, and at last it looks as if this is to be done. The bus companies won an important lawsuit in their protest against municipal regulations that sought to tie them down to certain streets, and it now seems almost certain that municipal buses will be put into operation to assist the street cars in the fight. It is asserted that the use of these municipal buses will be continued instead of the laying of further track.

An interesting fact in connection with the buses is that they are all single-deckers and it does not seem likely that double-deck vehicles will be put on the streets as they are claimed to be unsuitable for the type of traffic to be handled. Yet the operation of double-deck street cars has been entirely successful; a paradoxical state of affairs which can hardly be explained. The double-deck street cars are liked by the public and it has been almost as difficult a task to introduce the new single-deckers as to introduce double-deck rail vehicles in New York. It seems to be a case of what the public is used to.

In America there seems to be an impression that double-deck street cars are necessarily slow. This idea has probably become fixed for two reasons. In England the street car systems are undoubtedly less speedy than in America, and as the cars are mostly double-deckers the reason for slowness has been placed there. The other reason is that the passenger upstairs is inclined to imagine that the car is traveling more slowly because of the distance from the ground. In view of the prevalence of the idea that double-deckers are almost always slow and cumbersome, it is interesting to note that the Johannesburg system is as speedy as the average city and suburban system in America.

On the whole system an average speed of more than 10 m.p.h. is maintained. This is fast when the number of stops and the density of city traffic is taken into consideration. Although traffic is naturally not as dense as in large American cities, it is of a mixed character that makes it peculiarly difficult. Everything from ox wagons and rickshas to automobiles and motor trucks is met with and tie-ups are frequent in spite of good police supervision.

Routing has been planned to serve to the best advantage both the city and suburban travel. In most cases the ordinary city-type track has been laid in the center of the town, changing to sleeper track about 2 to 3 miles out. In one or two instances, however, it has been found possible to change to sleeper track laid at the side of the road within ¾ mile of the central terminus. This central terminus is right in the heart of the city next to the city hall, and ample space is provided for a number of tracks and for turning cars not scheduled on straight-through runs. While most cars now stop and turn at the terminus, some go through to other suburbs, and this practice is to be continued and extended.

About 60 suburbs are served, some of them 6 miles and more from the center of the city. On the eastward and westward routes, along the gold-bearing reef, the cars run in competition with the government railways and good speed has to be made. The question of stopping places in the city has always been a difficult one owing to vested interests, and until quite recently many attempts to reduce the number were frustrated. Now, however, most city stops are a distance of two or three blocks apart, the blocks being small and the total distance from signal to signal around 120 yd. Imme-

diately the cars get outside the city limits the stops get less frequent, distances of 240 yd. being quite usual.

Even the oldest cars have been kept in excellent condition and can accelerate rapidly. They are equipped only with hand brakes, however, with magnetic rail clamps for emergency. All the new vehicles have air brakes and attempts will be made to equip the entire 200 passenger cars with Westinghouse brakes in the near future. On no cars are the motormen protected by glass screens. This is done at the request of the men that they go unshielded. In 1920 a glass-screened car was put into service, but the motormen said they found it too warm. Really cold weather and long rains are infrequent in Johannesburg, and the question of protection for motormen has been finally dropped. All the cars have tops over the top decks, however, and the new types provide glass side protection for passengers up as well as down stairs.

Speed of the slowest cars is between 18 and 20 m.p.h. on the level, while the latest can do up to 25, developing more on long runs. Speed is well maintained by good distribution of power and there is no perceptible slowing down over distant sections. The power is boosted on some of the many long hills. New cars travel up the mile-long 8½ per cent grade of the Zoo hill at 16 m.p.h. The track is so well laid here that speeds of 30 m.p.h. are made on the down grade, with compulsory stops for brake-testing purposes. Operation on this hill is typical of that on many other long and steep grades in the suburbs. In the twenty years of electric car operation in Johannesburg the system has earned a name for safety as well as speed, for fatal accidents have been few. Only two cars have turned over in all this time, and only one of these accidents was attended with a fatal result to a passenger. While motormen are allowed to speed their cars on long, straight stretches where the track is on the side of the road and does not interfere with other traffic, great care is taken at crossings, points and curves, and derailments have thus been brought to a minimum.

Few cities are as dependent on their street car systems as Johannesburg. The railroad serves only a few suburbs on the east and west and the buses serve only one or two districts not touched by the cars. The citizens have got the "home-to-lunch" habit strongly developed and it is only residents of the far-away suburbs who stay in the city between 1 p.m. and 2 p.m. To meet this desire the tramway department operates an excellent express car system from about 12.45 p.m. on all lines to distances of 4 miles. The cars used for expresses are the latest ones with American chassis and some runs worth mentioning are made. From the Town Hall to Parkview is four miles and the busy luncher can rely on getting there at best in twelve minutes or at worst in fifteen. The ordinary time is 22½ minutes. From the Town Hall to Melville is 3½ miles and express car time is thirteen minutes. The luncher can be sure of getting to his home and back to his work at an average speed of between 15 and 20 m.p.h. So good are the expresses that many a citizen uses a street car instead of his automobile for his lunchtime excursion. It is by service such as this that the trams have become popular in Johannesburg, and although a large section of the public went to buses as something new, thinking that it would get service that was even faster, the wave is now on the turn and the street cars are more than holding their own. The buses, while faster at first because they had fewer stops to make until they became popular, are now very little speedier than the street cars and have to take chances in the way of speed in traffic to maintain any superiority. Moreover, they are not so reliable as the cars.

Mixed Traffic, Including Everything from Oxcarts to Motor Trucks, Is Somewhat of a Handicap to Tramway Operation

The most infrequent schedule on which cars are operated to the less populous suburbs is 22½ minutes, with specials in between during rush hours. On some lines, however, the public has what amounts to a two-minute service and suburbs at a moderate distance have cars every 7½ or fifteen minutes. The privately owned buses have not been able to maintain this frequent headway. The losses due to bus competition have not been in any way more severe than has been the case where wars have been waged in American cities, and the street cars in Johannesburg, after about eighteen months of loss, have started to show substantial profits. The service has always been considered a profitable one and the operating figures indicate that it is economically managed. Revenue averages between $200,000 and $250,000 per month, a small amount of this being obtained through advertising spaces sold inside and outside the cars. An average of about 90 cars is

operated during slack hours and 140 and more during rush hours. Passengers carried monthly average between 3,800,000 and 4,000,000, so that it will be realized the cars work a great part of the day. Earnings average about 5 cents per passenger, although there is no flat rate, the zone system being used.

The zones are 2d. (4 cents) cash, a zone being an average length of a mile for the near suburbs and 1½ miles for long-distance runs. For instance, it is possible to travel from the central terminus to Rosebank, a distance of more than 6 miles, for 16 cents cash, with a reduction of 33⅓ per cent for coupon holders. Coupons are printed in books of eighteen for 48 cents, and consequently the coupon-holding number of passengers is large. Cash fares are in the minority. It has been found better in practice to charge comparatively high cash fares and the lowest possible rates for regular travelers. It is thus possible to travel about 6 miles for a fraction over 10 cents. Receipts average around 42 cents per car-mile and costs about 40 cents.

Various tickets have been used from time to time, in practice the colored system having proved out well. The conductors punch the tickets with the usual small registering collectors and they have to keep logs as well. The bottom portion of the coupons is detached by the conductor and the coupon is punched with ordinary clippers. The zone system presents a few more difficulties in organization and fare collection than the flat rate and there is talk of trying out the latter in the near future. The zone fares have worked so well, however, that it would hardly seem advisable to rule them out.

The Johannesburg Tramway system cannot be called interurban, but the cars connect up with the systems of buses and trackless trams of adoining municipalities. The last direct contact with trackless cars went a few years ago when Germiston gave up this system for buses. It is possible to travel from Johannesburg to Springs on the East Rand, a distance of 30 miles, by street car, bus and trackless car, although the train is always used for through journeys.

Industry Needs Merchandising Viewpoint

First Sectional Conference of the Advisory Council, Held in Chicago, Develops an Optimistic View of the Electric Railway Situation—Leaders Demand Confidence and Courage—Need for Improved Cars Emphasized

"THERE is a growing feeling that the clouds on the electric railway horizon are being rapidly dispelled by renewed confidence and initiative on the part of its leaders."

B. C. Cobb, chairman of the Advisory Council of the American Electric Railway Association, sounded this note of optimism in opening the first "owner-manager" sectional conference, held in Chicago on Feb. 24 and 25. Approximately 100 railway executives representing properties throughout the Central territory met at the invitation of Managing Director Storrs for a frank discussion of some of the basic factors in the electric railway situation. There was no formal program. The plan for the meeting as arranged by Mr. Storrs was simply to give an opportunity for those who are endeavoring to foresee the destiny of the industry to analyze current tendencies and to exchange ideas.

Taking the needs of the industry as his theme, Samuel Insull called for renewed courage on the part of its leaders. "The crying need of the electric railways is capital," he said. "Unless a utility has the confidence of the public, its securities are not a good investment. Confidence is the backbone of good public relations." But he added that the first step in the rejuvenation of the electric railway industry is to build confidence in their own industry on the part of railway executives and employees. "Unless railway men are 'sold' on their own business," he maintained, "they cannot hope to win the required support and confidence from the public that are so essential to success."

Mr. Insull did not mince his words. He expressed doubt as to whether railway men in general have learned how to sell transportation. He deplored the tendency to follow old-time precedents and habits. "A modern merchandising viewpoint to meet the new competitive conditions in the transportation business is needed," he said. He called attention to the all-important matter of rates of fare and pointed out that the fixed fare, although simple to collect, does not always make a balance sheet that will attract necessary new capital. He questioned frankly whether or not railway men understand yet how to sell their service and expressed doubt as to whether the fundamental economics of the transportation business is thoroughly understood.

"Once the fundamentals are thoroughly understood and confidence is restored within the industry itself as well as in the minds of the public it serves, a long step toward the restoration of the electric railway industry will have been taken," declared Mr. Insull. With public confidence and good will, the avenues to badly needed capital will be opened up. He advocated widely distributed ownership of utility securities in the community served as the greatest single safeguard from the attacks of unscrupulous politicians.

INDUSTRY IS SOUND

Continuing where Mr. Insull left off, Henry L. Doherty declared that nothing fundamental has affected the soundness of any branch of the utility business. If sufficient thought on the part of communities can be directed toward a basic understanding of the position which transportation occupies as a fundamental necessity to community development, relief from traffic difficulties, unfair tax burdens and inadequate fares can be obtained, he maintained. Just as it is a perfectly idle thought to assume that any modern community can get along and develop without an adequate system of transportation, he pointed out, so also is it futile to expect that such a system can be operated and improved to meet the needs of a community without assuring the safety and an adequate return on the invested capital.

Mr. Doherty called attention to the inevitable result of failure on the part of the public to recognize these

basic principles. This, he said, results in the deterioration of service to an extent which imposes a heavy loss on the community in the form of retarded development, and ultimately brings a heavy additional expense for rehabilitating a crippled transportation system.

LITTLE TO FEAR FROM BUS

"The railway industry has little to fear from the bus," he declared. "If this new vehicle can successfully compete with rail lines, this fact should be established as soon as possible and immediate steps taken to develop transportation systems with that end in view. Up to the present time, experience with the bus has given no indication that it will replace rail lines except in limited instances. Only a united front on the part of the industry will establish these facts in the mind of the public."

Mr. Doherty also touched on the fundamental economics of railway fares. In transportation as in other branches of the industry, he explained, a large part of the cost is represented by the readiness to serve. Although the passenger benefits from this readiness to serve, the expense of meeting his actual use of the service is a comparatively small part of the total cost of establishing and maintaining facilities whose cost is fixed regardless of the amount of service used. The provision of these facilities, according to Mr. Doherty's views, affects the value of property in the community. Thus by assessing all or part of the readiness-to-serve cost in the form of a tax on the benefited property, the car rider himself would be required to pay only for the service which he actually uses.

Co-ordination of all forms of community transportation was held to be essential to the elimination of unnecessary duplication and waste. As part of such a complete co-ordinated system, he advocated that taxicabs should be considered as a public utility. In this way the service given by rail lines and buses would be made complete.

Other speakers included Britton I. Budd, G. A. Richardson, A. L. Drum, H. B. Flowers, Gen. Guy E. Tripp, Walter A. Draper, Capt. L. Vickers, A. C. Blinn, John J. Stanley, J. P. Barnes, T. A. Kenny, J. H. Alexander, B. W. Arnold, Dudley Montgomery and H. V. Bozell. In addition to the general status of the industry, public and employee relations, car development and bus operation constituted some of the subjects discussed.

CAR IS SALESROOM OF TRANSPORTATION SERVICE

"The sale and delivery of electric railway service is lodged in the car itself," said A. L. Drum in discussing the part which the electric railway car must play in popularizing electric railway service. Despite the merchandising importance of the cars on a given property, he asserted, they represent only between 15 per cent and 20 per cent of the total investment. Thus he explained that improvements in cars offer a means of popularizing electric railway service at a comparatively small cost in comparison with the total investment involved. It has been repeatedly demonstrated, he insisted, that improved light-weight cars will give savings of from 4 to 5 cents per car-mile in comparison with older and heavy equipment. Thus improved equipment offers the opportunity of making savings that approximate 15 per cent of the operating expenses of the average property. This, he estimated, would frequently add 50 per cent to the net earnings of such a property. Mr. Drum also cited an example of the saving in track construction cost which could be made through the use of light-weight cars. In this instance a property having 6 miles of track to rebuild found that through the use of lighter track construction made possible by lighter-weight cars the saving in track cost would pay the total cost of the new cars.

EXPRESSES FAITH IN IMPROVED CARS

Faith in Mr. Drum's proposal for improving the attractiveness of cars was expressed by Gen. Guy E. Tripp. The railway industry faces problems not met by other branches of the utility business, he explained. This is due to the existence of competition in transportation. Here, however, the situation is unique because the electric railways are a public utility and must provide a complete service. Since they are also subject to regulation both as to rates and service, the factors in competition cannot be given free play as in the case of other business enterprises. He held, nevertheless, that railways must recognize the necessity of meeting competition and that since regulatory bodies are partly responsible for the results of their operation, railway management should continue to press for relief from restrictive tax burdens. He advocated increased effort in placing before the public the necessity for a rate of fare which will permit a fair return to be paid on invested capital. He expressed confidence in the future of electric railways and maintained that they can be put on a paying basis.

Further comment on Mr. Drum's remarks regarding the importance of the car in popularizing electric railway service was added by Britton I. Budd. He declared that Mr. Drum's suggestion was vital to the industry. Equipment and service which were at one time satisfactory no longer meet the demands of the modern public. The public today, he explained, has become educated to luxury and speed. In some smaller cities automobiles pass electric cars at will. Under such conditions the speed of cars should and can be increased. On interurban properties when autos pass the electric trains a bad sales psychology is developed. He insisted that electric railways which expect to build up traffic must furnish the speedy transportation demanded by the public.

There has been a failure on the part of cities to plan their transportation requirements in advance, according to Mr. Budd. This has materially affected the development of such communities. When traffic congestion in the business district of a city interferes with the transaction of business, it results in the development of outlying community centers. This process, he pointed out, is rapidly taking place in some of our large cities and will continue until some means is found of relieving the situation in the principal business district.

There are three principal factors in the success of transportation service, according to G. A. Richardson. From the standpoint of management, these consist, first, of selling the organization itself; second, giving proper service and, third, with the help of enthusiastic employees and efficient service, selling the public. Experience in bus operation and the importance of human contact between management and men supported by application of the golden rule in employee relations formed additional subjects for discussion. Chairman Cobb expressed gratification at the success of this initial conference in bringing together financial leaders and operators for the discussion of problems important to the success and development of the industry.

Association News & Discussions

Southern Equipment Men Hold Annual Meeting in Mobile

Delegates Consider Questionnaire on Maintenance Practice Comprising 54 Topics—Papers on Gas-Electric Bus, Controller Maintenance and Repair Practice in New Orleans Also Presented

A THREE-DAY session of the Electric Railway Association of Equipment Men, Southern Properties, was held at the Battle House, Mobile, Ala., on Feb. 24-26. During the period since it was organized some four years ago this association has established an enviable record for the assistance which it has given its members in solving their equipment problems. Two meetings are held each year at which questions relating to the every-day equipment practice of the companies are considered at an informal "round table," and a few papers are presented. At these meetings and during the year maintenance performance records, particularly the number of pull-ins per 1,000 car-miles for all of the different properties, are compiled and compared, and in other ways the association aims to improve the standard of maintenance and exchange helpful information.

The sessions at Mobile were presided over by A. D. McWhorter, general superintendent of the Memphis Street Railway and president of the association, and some 50 representatives of member companies and supply men were present.

The opening of the first session was the occasion for everyone to become acquainted, after which President McWhorter spoke of the importance which reliable equipment had in creating and maintaining good public relations. After all, transportation was what the public wanted, and it was the duty of the equipment men to see that this was supplied by clean, comfortable cars which would carry the passengers safely to their destination, in a speedy manner. He also explained the postponement of the meeting for a month by the fact that he and the secretary, Mr. Taurman, had been called to make a report on the Havana Electric Railway. This line, Mr. McWhorter said, has 34 miles of double track and a total single-track equivalent of 97 miles, there being 63 miles of route. The ratio of inhabitants in the city to miles of route is quite high, being 8,100, as compared with 2,650 in New Orleans, 2,300 in Memphis and 2,120 in Birmingham. The population of the city per square mile is high and the number of revenue passengers per square mile is also high. The conditions of street congestion are quite bad. The company has 2,700 trainmen, including 50 colored motormen, and the schedule speed of the cars is 8½ m.p.h. Only four passengers are permitted to stand on a car. There is considerable jitney and taxicab competition, the former being known in Havana as "guagua" and the latter as "alquela." The jitneys are Fords or other low-priced automobiles or converted trucks and charge a 5-cent fare. The taxicabs are very numerous and charge 20 cents per zone.

The report of the committee on classification of pull-ins was presented by the chairman, W. H. McAloney, superintendent of equipment Georgia Railway & Power Company. After discussion the classification given in the adjoining table was adopted.

Three formal papers were also presented at the session on the first day, namely: "The Gas-Electric Bus," by J. C. Thirlwall, General Electric Company, Schenectady; "How We Improved Our Pull-in Records in 1925," by Frank T. Dawkins, electrical engineer of that company, and "The Overhauling of Controllers," by T. R. Bristol, assistant superintendent of equipment Georgia Railway & Power Company, Atlanta, Ga. Mr. Bristol's paper is published in abstract elsewhere in this issue. The other papers will be abstracted in an early issue. A. Taurman, superintendent of equipment, way and structures Birmingham Electric Company, gave a talk on car inspection at Havana, Cuba, which he had recently visited. He spoke of the climatic and other conditions in Havana, some of which made equipment maintenance simple, but others, like the narrow streets, added to the difficulties. He said the property was well maintained.

There was a discussion on radio detection of defective cars and reduction of inductive interference. John Gerson of the Charleston Consolidated Railway & Lighting Company contributed the results of some tests made on that property, and other speakers gave facts in regard to the detection by radio equipment of leaky transformers by power companies.

The accompanying charts are reproduced from a blueprint pamphlet given to each delegate, giving records of

Delegates and Guests at the Mobile Meeting of the Electric Railway Association, Equipment Men, Southern Properties, Feb. 24-26

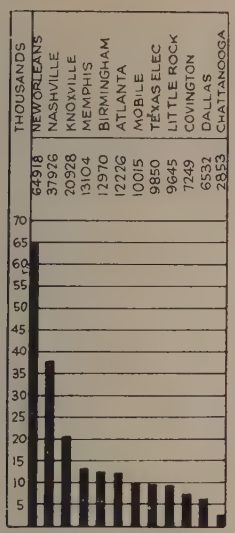
PULL-IN CLASSIFICATION ADOPTED FEB. 25, 1926

Chargeable to Equipment Account

Armature, grounded.	Headlights.
Armature bands.	Signal lights.
Armature shaft.	Door switch.
Armature bearing hot.	Heaters.
	Electric bells.
Axle bearing hot.	Lightning.
Commutator.	Car charged.
Brush yoke.	Axles.
Brushes and holder.	Wheels.
Fields.	Journals and boxes.
Fields jumper.	Hot journals.
Motor leads.	Hand brakes.
Gears and pinions.	Slack adjusters.
Gear cases.	Brake rigging.
Other motor trouble.	Other truck troubles.
Trolleys.	Doors and riggings.
Circuit breakers.	Door treadles.
Line breakers.	Windows.
Main fuse.	Seats.
Controller.	Steps.
Cables.	Registers.
Rheostats.	Signs.
Air brakes.	Gongs.
Safety car equipment.	Sand rigging.
Door engines.	Fenders.
Whistles.	Draw bars.
Frozen air.	Snow scrapers.
Other air troubles.	Other body troubles.
Lights.	Unclassified.

Not Chargeable to Equipment Account

Accidents.	Broken glass.
Split switches.	Trouble reported, none found.
Derailments.	
Doors and steps.	Unclassified.



Average Miles per Pull-in for 1925

miles per pull-in on different member properties since they joined the association. As will be seen, these give an almost continuous record of improvement in maintenance conditions since the association was organized and records began to be compiled.

Round-Table Discussion

The greater part of the remaining sessions of the association were given over to the discussion of a series of 54 questions which were printed in advance and were considered seriatim. A summary follows:

The first question related to experience with devices to eliminate water from air-brake systems. It developed that no companies are using any method except that of draining the tank and paying especial attention to piping. The consensus of opinion was that proper installation of piping would eliminate the trouble.

On the question of side wear on brushes of modern ventilated motors with high-speed armatures it was the belief that most ventilated motors showed this trouble. The latest practice of taking the air from the top of the motor, thus eliminating most of the dirt and consequently the principal cause of the side wear, it was thought, would greatly reduce this trouble.

On the use of Rico oilers for modern motors it was found that none of the companies had any extensive experience.

Most members are using pit wheel grinders; two reported employing wheel truing brakeshoes.

The majority of companies represented use baking ovens of sheet iron, lined with asbestos and electrically heated. One company reported it had built an oven of fire brick and clay and considered it superior to the more common sheet iron and asbestos type.

A great variety of practice was found as regards the material used in which to dip armatures. Two companies use a varnish on their armatures after they have been dipped and dried out thoroughly.

Several delegates reported great trouble with broken motor bolts even when using the best heat-treated bolts. Others find the ordinary bolt adequate. It was suggested that some of the trouble with threads stripping may be caused by too great tightening of the nuts.

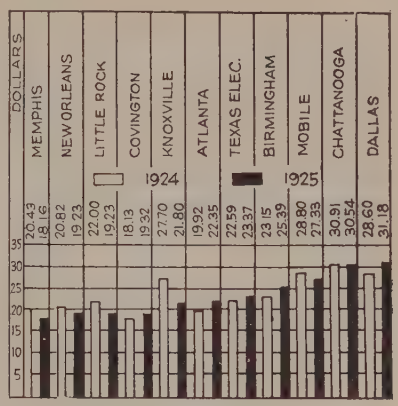
Between enamel and lacquer for car painting most of the companies are using the former, though one, on the last 40 cars ordered, specified 25 to be finished in enamel and fifteen in lacquer. It was thought that there is not much difference in cost, but enamel dries more quickly. The chief trouble in paint maintenance is in the bottom door panels and the bottom sash stiles. Metal sash frames have been ordered by at least one company.

The next question related to the accounts to which time for brake and truck inspectors replacing brakeshoes and tightening motor and truck bolts and minor repairs was charged. One company, after a trial period, decided to charge the time of the inspectors, 70 per cent to inspection and 30 per cent to maintenance. On other roads, time cards are used.

Between bronze and malleable iron and babbitt for axle bearings, most members prefer the former. At least one company adds a film of babbitt about $\frac{1}{16}$ in. to its bronze armature bearings.

No companies reported waxing cars, though two Southern companies, not in the association, are said to do this every six months. On the question of white cars it was reported that one company, not in the association, which had adopted this color was giving it up because it showed dirt so easily.

Two companies are using aluminum field coils, one having used them for from four to five years.



Comparative Maintenance of Equipment Costs

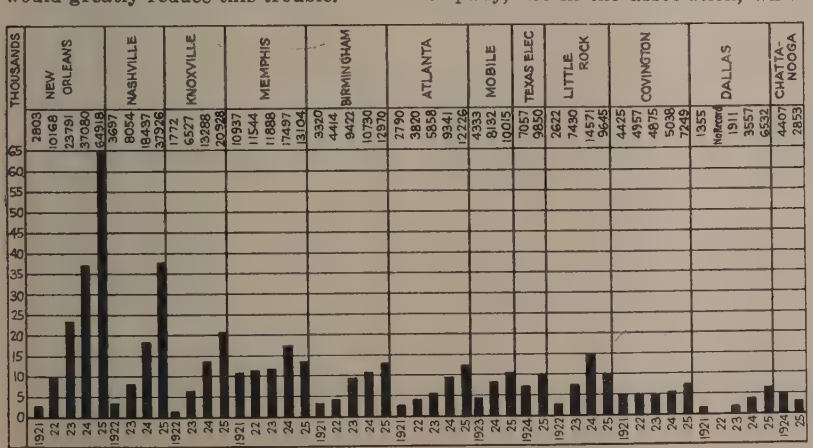
Educational Courses Given

Several companies are giving, or have given, courses in maintenance to shop men. On one system lectures were given by the master mechanic and engineers, at the shop, for one hour a week. Half of this period was on company time, the other half on the men's time, and no one was accepted for the course unless he signed up and agreed to stay through the course. It proved very popular. Another company sent seventeen or eighteen of its men to an engineering night school and several give talks to their men from time to time, especially on the cost of material used in maintenance. Four companies have issued instruction books for the use of its men.

The use of welding for repairing broken armature shafts is not common, the general opinion being against this practice, though some companies manufacture their own armature shafts out of old 4-in. heat-treated axles.

Acetylene, electric and thermit welding are used for repairing broken motor frames, though electric welding is the most commonly used. One company scarfs the crack with acetylene, then uses the electric weld for filling up the crack.

The two principal causes for chipped flanges on cast iron wheels given were obstructions like bolts, in the rail groove and improperly repaired special work which had been welded by the track department but not ground out properly. Most of the companies use a difference of $\frac{3}{4}$ in. between wheel gage and track gage, but one company reported considerable trouble with a difference of more than $\frac{3}{4}$ in. Most of the companies said there had been an increase in flats on cast-iron wheels, due, it was thought, largely to the misuse of sand by the motormen, but also partly to more sensitive brakes. One company recommended the use of grease lubrication on the air-brake valve rather than oil, because oil gets dry and the motorman, in making a stop, throws the valve to the emergency position by mistake. Several of the companies are using steel wheels to a greater or less



Average Miles per Pull-in by Years 1921-1925

extent and report a mileage from them of from three to four times that of cast-iron wheels.

One company reported the use of trolley shoes on its interurban lines and its representative believed the supply of current was more uniform and there was a great reduction in wear on the wire from sparking. The chief trouble came when inspectors increased the trolley pressure to 40 lb., whereas half of that was adequate. One Southern company not in the association, which is using shoes exclusively, was reported to be greasing its trolley wire once a month.

In general, the companies which use circuit breakers do not also use fuses. A variation in practice was found in the location of the fuses, being sometimes on the platform and sometimes under the car.

Short Ground Leads Desirable for Lightning Arresters

An equal variety of practice was found in the position of the lightning arrester. One company using electrolytic arresters carries them under the car where they are easy to inspect. Another, using aluminum arresters, places them on the top of the car, where they are inspected by the trolley base inspector. The argument for placing them on top was that it gave a shorter and direct ground.

The principal modern makes of gears and pinions have users among all the companies represented. Some records for gears given were 500,000 miles and for pinions 200,000 miles. One company reported a make of gear used since 1911 with none yet worn out. Another uses cheap gears with old motors, expecting both can be discarded about the same time.

Air gongs are used by several of the companies but some trouble was reported with the cylinder type of gong from freezing. This trouble is not experienced with the ball type. One company is using rotary gongs, worked by the foot.

Periods of washing cars vary from every day to every week, though most of the companies have their cars swept out every time they return to the barn. Soap is used by a few companies but generally only on the floors. One company with linoleum flooring said it had to be washed once a day.

One company is using a battery testing machine for testing armatures and fields without removing them from the car. Others have the Century tester.

Slat Seats Favored in the South

A vigorous discussion developed over the proper material for seats, the majority opinion being strongly in favor of slat seats. In one city these are required by a rule of the board of health. The coverings discussed were rattan, leather, plush and a material in which rubber is a constituent. Plush was criticised as hard to keep clean, expensive to maintain, and soiling the clothing of passengers in hot weather. One delegate declared that in the South with plush seats it would be necessary to use slip covers in hot weather.

In general, solid carbon brushes are used on motors, although some companies prefer the split type. A variety of makes are used.

Some companies use water for scrubbing the floors sometimes applied through a hose, but others do not permit the use of water within car. Those who use it admitted that it might be detrimental.

In general, sentiment favored the use of single-end cars on account of their lower first cost and cost of maintenance. By the use of a line switch and motorman's valve at the rear end, these cars can now be arranged for emergency backing. One company reported the recent purchase of 30 single-end cars for $30,000 less than double-truck cars would have cost, with increased seating capacity and reduced weight, but considerable money had to be spent in providing loops. It was admitted that the single-end car was less flexible from a transportation standpoint.

Welfare work in the form of group insurance, loans to needy members, etc., is common among the properties represented in the organization and is usually conducted through the mutual benefit association.

Different methods are used in installing window glass. Putty and beads are used by some, rubber by others, and one company uses rubber on the top sash but putty on the bottom sash.

A few companies are using non-scale air pipe and find it satisfactory. Both air operated and electrically operated registers are used to some extent.

Two companies said they were using home-made waste reclaimers. Attention was called by one of those present to the satisfactory results obtained by the centrifugal machine.

Most of the companies have a certain amount of all-rubber motor lead cable in use, though in most cases for less than two years. One case of the use of this type of cable for four years was reported. Three or four companies also reported the use for a short time of the new General Electric D.B. 986 line breaker with L.B. 2-A handles.

The final subject discussed was the desirability of dispensing with trapdoors in the floor. The principal objection seemed to be the difficulty in adjusting motor brushes, but it was reported that this could be done by feel, after some experience. Inspection of motor leads also gave some trouble when there was no trapdoor.

Election of Officers and Other Business

The technical sessions of the association lasted for the first two days of the meeting. On the evening of Feb. 25 all those in attendance at the convention were the guests of the Mobile Light & Railroad Company, at a fish dinner, served in the Battle House. Mobile is famous for the delicious flavor of the fish caught near its harbor and about 50 delegates enjoyed the hospitality of the company.

On Friday morning a short business meeting was held at which A. Taurman presented his report as secretary and treasurer. It showed that the association, on the basis of $50 a year annual dues for each company, was in good financial condition. For officers for the coming year, the nominating committee, consisting of S. M. Coffin, Mobile; W. H. Curtis, Little Rock, and J. J. Vaughan, Memphis, proposed the present incumbents for another term. They were unanimously re-elected.

Invitations for the place of the July meeting were received from the Chattanooga Light & Railway Company to meet in Chattanooga, from the Central Electric Railway Association to hold a joint meeting with that association on its boat trip next summer, and from the Ohio Brass Company to meet in Mansfield, Ohio. It was finally decided to hold the next meeting in Chattanooga, Tenn., on July 28, 29 and 30.

Resolutions were passed thanking the officers for their services during the year and expressing the appreciation of the association to the local committee, consisting of F. F. Rossman, vice-president and general manager, and S. M. Coffin, superintendent of equipment Mobile Light & Railroad Company, for their hospitality and the enjoyable time had by all. The meeting then adjourned.

After the meetings had finished the members and their guests were taken on an automobile ride, through the courtesy of the officers of the local system, to see the city and the points of railway and historic interest.

COMING MEETINGS OF *Electric Railway and Allied Associations*

March 8-11—National Railway Appliance Association, annual exhibition, Coliseum and Annex, Chicago, Ill.

March 9-11 — Oklahoma Utilities Association, annual convention, Mayo Hotel, Tulsa, Okla.

March 11—Pacific Railway Club, ninth annual meeting, Fairmont Hotel, San Francisco, Cal.

March 12 — Pennsylvania Street Railway Association, annual meeting, William Penn Hotel, Pittsburgh, Pa.

March 17-18—Central Electric Traffic Association, Portage Hotel, Akron, Ohio.

March 17-18—Illinois Electric Railways Association, Illinois State Electric Association and Illinois Gas Association, annual joint convention, Springfield, Ill.

March 23-25—National Conference on Street and Highway Safety, Washington, D. C.

March 29-31—National Conference on City Planning, St. Petersburg, Fla., April 1—West Palm Beach, Fla.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 28-July 2 — Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

Oct. 4-8—American Electric Railway Association, annual convention, location not yet determined.

Shop Practice in Overhauling Controllers*

By T. R. Bristol
Assistant Superintendent of Equipment Georgia Railway & Power Company

CONTROLLERS are not removed periodically for overhauling. When cars are overhauled controllers are not removed unless there is evidence of an insulation breakdown. This can be readily ascertained when the repairman has the insulating partition back of the controller cylinder out for cleaning, as the wiring is then visible.

When cars are overhauled the controllers are given a light overhauling on the car, which consists of removing the main cylinder and insulation partition back of the cylinder. An inspection of insulation on wiring and frame is made. The insulated partition is thoroughly cleaned of all copper dust and smoke and given a coat of insulating varnish. The controller cylinder is taken to the repair bench and new segments put on where necessary. Segments are cleaned up by filing. The top and bottom bearings are checked for wear, and bushings are renewed where necessary. The reverse cylinder is taken out and segments are filed smooth.

Main and reverse cylinders are assembled in the controller and fingers are renewed where necessary. Any rough fingers are removed, new ones installed and old ones are filed up in spare moments. Fingers are aligned properly and cut out switch blades are checked for tension and renewed where necessary. The series stop, star wheel pawls and springs are checked and repairs made if needed. The controller is then lubricated and its jacket is given a thorough cleaning with gasoline and brush, and the inside insulated covering is given two coats of shellac. This method may be termed light overhauling.

Controllers removed from cars for defects are given a general overhauling. They are completely stripped, with the exception that wiring is not removed from the finger board or from the back of the connection board. The frame, top cover, main and reverse cylinder, connection board and finger board are sand blasted to remove all copper dust, smoke and carbonized spots. Parts which may be damaged by sand blasting are taped up.

We are considering a modern sandblast equipment and in all probability will install it this year. It is known as the down-draft method, and consists mainly of a steel room with a special flooring and ceiling. Fresh air is drawn into the room through the ceiling by a suction fan and distributed evenly to all parts of the room. The floor consists of steel grating through which air and sand are drawn into a large hopper. Sand blasting is done on the floor or on a bench as convenience dictates.

It was deemed necessary to sand blast controllers because scraping and brushing did not eliminate all copper dust, carbonized spots and dirt. The insulation on the back is removed regardless of its appearance, because it has been found to contain moisture and considerable trouble was traced to this condition.

After sand blasting, the back is given two coats of clear insulating varnish. The asbestos paper is given one coat of clear insulating varnish on one side and fastened to the back while wet. After drying the asbestos paper is given a coat of insulating varnish to insure its being moisture-proof.

Main and reverse cylinders are cleaned up, segments filed smooth and renewals made where necessary. Then they are given two coats of clear insulating varnish. In cases where cylinders are found out of round, they are trued up in the lathe. It is only occasionally that we find a cylinder out of round, this usually being on old controllers which were not built on jigs.

Top and bottom bearings are checked up for lost motion. On K-35 controllers, having brass bushings, new bushings are inserted. K-28 controllers originally did not have a bushing in the bottom bearing. When putting on line breaker attachments we found considerable lost motion in the bearings which affected operation of the line breaker attachment. We bored out the bottom bearing and put in a removable bushing, similar to that in the K-35 controller. To do this it was necessary to reduce the shaft diameter at the bearing from 1 in. to ⅞ in. in order to get a bushing with ⅛ in. wall thickness.

The top bearing (in top plate) is brazed up and rebored where necessary. The bearing is first bored out oversize and then brazed up solid, to prevent breaking through into the old metal when reboring. Finger and connection boards and wiring are repaired and given two coats of clear insulating varnish and assembled in the controller. The controller is built up complete and after alignment of fingers is given an 1,100-volt alternating-current ground test for five minutes.

We have discontinued the use of molded insulating finger and connection boards, because we found that any burned place which will carbonize material will give further trouble, as it cannot be scraped out clean. We make finger and connection boards of hard wood, either cherry or maple, and after finishing put them in the oven and bake for six hours, at 200 deg. F.; then boil them in paraffin for about five hours. By this process we have found that the paraffin penetrates through the entire wood fiber.

Controller magnets are tested by checking the resistance. The outside insulation is removed and a resistance test is made. The resistance testing machine consists of a 6-volt storage battery, ammeter and variable resistance, all connected in series. The magnet coil is connected in series in the battery circuit, and the resistance unit is adjusted so a circuit of 2½ amp. is flowing through the circuit. A millivolt meter is bridged across the magnet coil and the drop is noted.

A low reading indicates shorted turns in the magnet coil. A high reading indicates a poor connection. The test is made primarily to detect poor connections, as wrong resistance and shorted turns have never been found. Repairs are made to the magnet coil and it is again checked for resistance, after which it is heated for two hours, dipped in plastic for one hour and baked for twelve hours.

After baking, the binding insulation is put on; for the K-6 and K-11 controllers it consists of two layers of 1½-in. asbestos tape and one layer of field webbing. The coil is dipped in plastic and baked for twelve hours.

The outer insulation of K-6 and K-11 magnets is merely a shield to protect the windings, three layers being sufficient. The K-28 controller magnets are slipped on an iron core and must be insulated against grounds. One layer of varnished cambric is first applied, then two layers of asbestos tape and one layer of ¾-in. linen tape are added. The coil is then dipped and baked. The design of the K-28 controller does not permit of heavier insulation on the controller magnet or we would probably add another layer of tape as a further protection.

*Abstract of paper presented at annual meeting of Electric Railway Association of Equipment Men, Southern Properties, held at Mobile, Ala., Feb. 24-26, 1926.

Making Trolley Company Complete Transportation Agency

New England Street Railway Club Discusses Bus and Taxicab Operation—Care in Establishing Co-ordinated Service Recommended

MORE light on the relations between bus and trolley was shed at the meeting of the New England Street Railway Club held Feb. 25 at the Copley-Plaza Hotel in Boston. This was scheduled for Feb. 4, but postponed on account of the blizzard that struck the territory. On the original program was a paper by G. T. Seeley, vice-president Chicago Motor Coach Company. While not presented, this paper will be published in the bulletin of the club, it was announced. The annual meeting of the club, to be held March 25, will be a "ladies' night" affair.

Papers on the relationship of the bus and trolley were given by W. B. Spencer, assistant to the president United Electric Railways, Providence; Edward Dana, general manager Boston Elevated Railway, and M. C. Horine, sales engineer Mack Trucks, Inc., New York. To supplement these J. A. Queeney, vice-president Mitten Management, Inc., gave impromptu the details of how the Philadelphia Rapid Transit Company had recently entered the taxicab business.

In picturing the trolley as the big brother and the bus as the little sister, and in urging trolley companies to become transportation companies, although not to a delirious extent, Mr. Spencer had the support of the other speakers. He illustrated possible growth by reference to a crosstown line in Providence. This started on a 60-minute headway. In about a year it had developed so that six-minute service was necessary. During that period revenue increased from 31 to 36 cents per

bus-mile in round figures. Mr. Spencer called attention to the field for small capacity buses. A twelve-passenger size making two or three trips an hour could replace a 40-passenger trolley, the latter run on an hourly headway. This would keep out transportation "bootleggers," or individuals running small automobiles in defiance of regulatory authorities.

Mr. Dana warned against the blandishments of bus salesmen and urged his auditors not to pay too much attention to bus costs. The bus should be looked at just the same as the turnstile or a rotary substation, all useful parts of the property and to be used to make the property profitable as a whole. In spite of the huge increase in the number of buses operated by the Boston Elevated (Mr. Dana explained that from nothing five years ago the system has grown to represent nearly 175 units) the mileage operated by the trolleys had increased, and it was expected that it would increase in the future. At the same time the bus should be developed in accordance with good business judgment.

Little sister is growing up and has become better looking, according to Mr. Horine. He held that the bus furnished a separate class of service which should be charged for at a higher price wherever possible and operated on a distinctive basis. It was dangerous, he thought, to carry over the "trolley mind" to bus operation. As examples of this he mentioned the failure to call streets, which has become quite general on trolleys. The bus was so low that passengers did not see the street signs or numbers well, so that drivers should always be careful to announce the street names. Mr. Horine also urged better route marking, quieter fare-registering devices and an effort all along the line to give a higher class service on the buses. Cleanliness and also the appearance of the drivers he believed to be more important than on the trolley. He would eliminate straps in buses, because of the bad name given them through yellow journalism. Reduced fares for school children frequently led to inconvenience for regular patrons and so special trips should be run to carry the children.

The 25-passenger bus, Mr. Horine declared, was the best for all around work; double-deckers had a place, but should not be used when they meant such infrequent headway as to result in a loss of passengers to other forms of transportation.

Mr. Queeney stirred the assembly to an appreciative demonstration when he recited an incident indicating that the efforts to become an all around company might have its limits. The owner of a local funeral business wanted to sell out to the P.R.T. and represented the value of the property by figures showing the diversification of the load factor. These indicated that there were 462 deaths a day in Philadelphia; of these, 37 per cent were Catholics and were buried in the morning, and the others in the afternoon. Most of the weddings were in the morning, and these also represented possible business. Mr. Queeney turned it down as it was more of a personal than a public business. Still he believed that the trolley company should not hesitate to take up any vehicle that could be operated at a profit. Trolley revenues, he maintained, had dropped off steadily in general for years and the only thing to do was to take up some new form of transportation. He cited the gas industry as an example of one that has come back after every one said it was doomed when electricity was introduced. The present trolley systems will come back to prosperity in just the same way, he prophesied, if they are willing to become a transportation industry. He would first have the trolley company take in the bus and then the taxi. If people wanted to ride on roller skates he suggested furnishing even them.

The Philadelphia system has taken delivery so far of 250 buses and has carried 11,000,000 passengers in six months. This year Mr. Queeney looks for a business of not less than 30,000,000 passengers. Bus operation would be extended as fast as required. Commenting on the recent purchase of a taxicab company by the P.R.T., he said he could see no reason why this type of business should not be handled if people wanted the service and if it was making inroads into the other business of the transportation company. The purchase of the Yellow Cab Company in Philadelphia involved 950 taxicabs, which last year carried 10,000,000 passengers. There are about 1,500 or 1,600 taxicabs in Philadelphia, he said, and these will be bought if they can be secured at a fair price that will be approved by the State Public Service Commission.

According to Mr. Queeney, the taxicab business in New York City is taking in more money than the street cars. There are 18,000 taxicabs there, earning from $25,000,000 to $30,000,000 a year. If the present rate of growth is maintained in Chicago the same condition will exist in another two years.

Bus maintenance was taken up at an afternoon session, when systems and methods used in their organizations were described by C. V. Wood, Jr., superintendent bus division United Electric Railways, Providence; H. I. Sullivan, automotive engineer Eastern Massachusetts Street Railway, and D. S. McKay, supervisor of automotive equipment Boston Elevated Railway.

American Association News

Wheel Gages

SEVERAL new standards for wheel gages were decided on at a meeting of special committee No. 8 of the way and structures committee assigned to study the subject of various types of wheel gages, which held a meeting at association headquarters, New York, Feb. 26. The following were present: C. W. Squier, chairman; C. A. Alden, W. S. Adams, Hugh Savage and A. W. Baker.

It was recommended that the two standard A.R.A. wheel contours which now appear in the Manual should be designated as *E* and *F*. Contour *E* is A.R.A. standard for chilled iron wheels as adopted in 1909, and *F* is A.R.A contour for steel and steel-tired wheels standardized in 1920.

The committee decided to recommend the use of the standard A.R.A. mounting and check gage for mounting wheels with A.R.A. contours. This gage is to have a center point added similar to the A.E.R.E.A. standard wheel mounting gage. The committee reviewed the present association standards of limit of wear gages for standard contours, and also the various types which are used by the American Railway Association. The present association standards provide only for a limit of flange thickness. It was considered desirable that these gages should also provide maximum and minimum limits of flange height, and new designs for gages will be prepared with these additions.

In considering revisions of the wheel checking gage as submitted by the 1925 equipment committee, it was decided to resubmit the gage with all references to the A.R.A. contours omitted, so that this gage will apply only to contours *A*, *B*, *C* and *D*.

The subject of taping wheels was discussed and it was decided to submit a wheel circumference measure for wheels similar to that used by the American Railway Association. The dimensions, however, will be modified so as to meet the present practice as to the point for taping narrow tread wheels.

Special Reports Available

SPECIAL reports as listed below have been prepared by the Bureau of Information and Service of the American Electric Railway Association and are available to member companies upon request:

Bulletin No. 69.—Wages of Trainmen.—This is an entirely new edition of our regular wage bulletin, based on replies of approximately 500 companies to a questionnaire sent out in February. It shows the present wage scale, the effective date and date of expiration, the previous scale, union affiliations of trainmen, number of men employed, contract conditions governing wage scale, and the average weekly wage earned by regular and extra men under the scale.

Bulletin No. 70—Wages of Bus Men.—This compilation shows substantially the same information for bus operators as is shown in our bulletin of trainmen's wages, namely, present scale of pay, effective date and date of expiration, union affiliations of bus men, number of bus men employed, average weekly wages earned under the scale, etc. The data of more than 150 companies are included in this bulletin.

Bulletin No. 71.—Public Ownership and Operation of Electric Railways, Part 2, Canadian Companies.—This is a compilation of the outstanding facts concerning the public acquisition and operation of electric railways in Canada. It includes a list of publicly owned or operated railways, a history of the events leading up to their acquisition, the terms on which they were taken over, and statistical data on the results of their operation under public management.

In addition to the above, supplements to the Fare Bulletin and Cost of Living Studies (Bulletin No. 72) have been prepared so as to bring them down to date.

Maintenance of Equipment

Door Handle Fit Made in One Operation

WITH manually operated folding doors and steps, it is the practice of the Eighth Avenue Railroad, New York, N. Y., to use an upright rod on which a handle fits for operating the mechanism. The handle fits become worn through service, so that it is necessary to bring these back to size. The expense of forming the handle fit on these rods has been reduced considerably by use of a die to form the end of the handle by means of a blow from the drop hammer.

The accompanying illustration shows the die used for forming and also the end of one of the rods with the handle fit completed. In practice, the rods are heated and upended so as to increase the size. Then the die is placed around the hot part and with one blow of the hammer the entire fit at the end of the rod and a lower shoulder are completed.

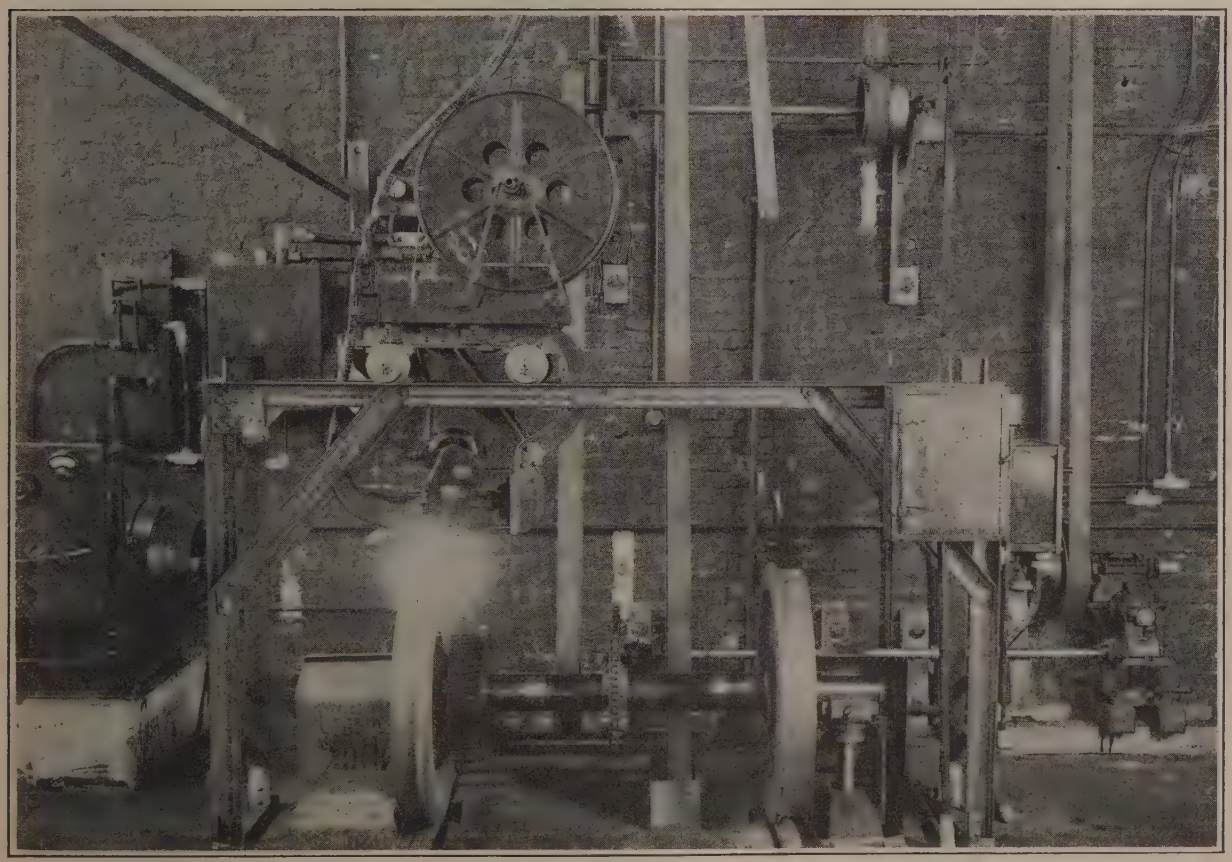
Making Handle Fits for Door and Step Operation
At left—A rod completed with handle fit at the end. At right—Die used to shape the end of the rod.

Flexible Arrangement for Welding Wheel Flanges

By J. R. BRITTAIN
Mechanical Engineer Los Angeles Railway, Los Angeles, Cal.

AUTOMATIC arc welding of steel wheel flanges by means of a metallic electrode is standard practice in the shops of the Los Angeles Railway, Los Angeles, Cal. The equipment used consists of a General Electric automatic welding head with supporting equipment and driving apparatus for the wheels designed in the mechanical engineer's office of the company. The entire mounting for the equipment was constructed in the shops of the Los Angeles Railway. An accompanying illustration shows the general arrangement.

The welding head feeds the wire



Equipment Used to Weld Wheel Flanges in the Shops of the Los Angeles Railway

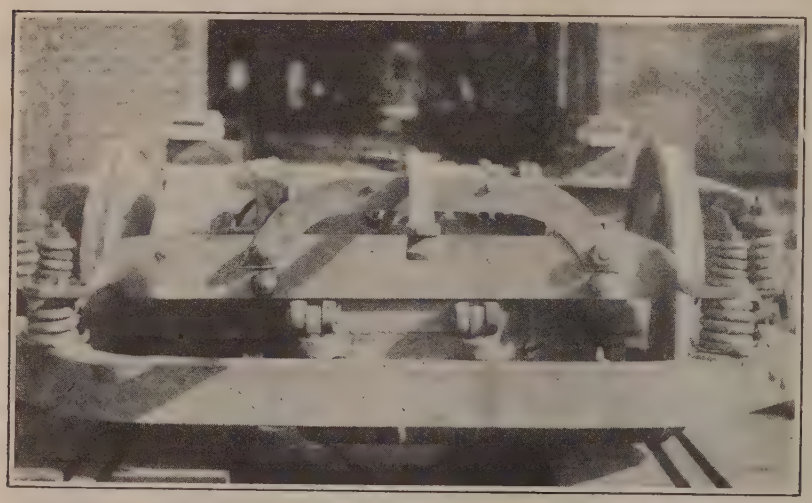
electrodes uniformly to the work at three different speeds, which are under the control of the operator. Wheels to be repaired are brought to the welding room track and are rolled to the welding outfit. Mechanically operated jacks raise the wheels from the track so as to allow free rotation. Standard bearings are used on the heads of the jacks so that the actual journals of the axle revolve in these bearings. A steel carriage mounted on a steel frame supports the welding head and also the reel which holds the metallic electrode wire. The carriage may be moved freely along the top of the framework and is brought over the second wheel when work on the first is completed.

To rotate the wheels, a split sprocket is adjusted to the axle and a link chain is slipped over its teeth so as to connect with a companion sprocket located on the driving axle about 4 ft. back of the wheel axle. The equipment used to drive consists of a 2-hp. variable speed motor with a maximum speed of 1,000 r.p.m. and a minimum speed of 500 r.p.m. This motor is connected by belts and pulleys with a speed reducer which is especially designed to bring the speed from 1,000 r.p.m. to one-third of one revolution per minute. On the reducer shaft are mounted two pulleys of different diameters, by means of which the speed can be reduced again so as to obtain travel at the periphery of the wheel ranging from 7.99 in. per minute to 32 in. per minute. The speeds intervening between these maximum and minimum limits are obtained by regulating the speed of the motor through a rheostat. In this manner, the wheels to be welded are revolved at exactly the same speed as that with which the electrode is fed to the welding head.

In order to keep the area to be welded continually clean and bright and to insure a steady arc, good penetration and a satisfactory weld, a set of circular steel wire brushes are mounted so as to be operated mechanically. These bear against the surfaces of the wheels and run at a speed of about 1,000 r.p.m.

Keeping Brake Rods Off Motor Cases

SOME time ago the Virginia Electric & Power Company had trouble on its Richmond, Va., cars with wear between the brake rod and the top of the motor. The trouble was most marked on some cars equipped with maximum traction trucks, when there was not much clearance over the motor, and with motors which were rather high, like GE-57, 67 and 90 and Westinghouse 101-B. However, the condition existed to some extent on a considerable proportion of the old double-truck equipment.



This Arch Support Prevents the Brake Rod from Chafing on the Top of the Motor

After some experimenting, W. J. Hicks, master mechanic of the company, decided to provide a wearing support for the brake rod to rest on. The results have been so satisfactory that the double trucks under all cars are being equipped with this support as the cars go through the shops. The end view of a truck equipped with this device, reproduced on this page, shows the general form and purpose of this support.

This arch support is made up of two pieces. One is a 1½-in. x ⅜-in. iron bar forged to the shape shown and riveted to the cross bar of the truck. The other piece is a 1½-in. angle bolted along the top of this arch bar to provide the flat surface on which the brake rod can rest and slide. A flat brake rod instead of round rod has to be used because of the small clearance above the support.

The device shown has eliminated all of the trouble from this cause formerly experienced.

New Equipment Available

Special Ballast Dipper

IN THE last few years ballast cleaning has become a matter of importance to maintenance of way officials, and as the handling of this material is very costly, particularly so on busy lines, much thought has been devoted to new methods of handling. To meet this demand the American Hoist & Derrick Company, St. Paul, Minn., has designed and built a special dipper stick on which the dipper is set at a rakish angle to permit it to dig in close to the ends of the ties.

For loading ballast with the American railroad ditcher equipped with the new special ballast shovel the usual dump car work train line-up is used. Due to its construction, the shovel is always operated over the right-hand side of the flat car on which it works. This means that when operating on one track of a double-track system the ditcher removes ballast from the space between ties to a depth of approximately 20 in. below the ties. This distance between ends of ties varies from 4 ft. 6 in. to 5 ft. 6 in. When the distance between ends of ties is 5 ft. 6 in. a 30-cu.yd. dump car filled reasonably full represents 75 ft. of ballast dug from between ties. This 75-ft. distance increases as the distance between the ends of ties decreases.

With one car filled, the ditcher turns through 180 deg. and operates over the other side of the flat car, now facing the second dump car. It fills this second dump car with foul ballast removed from the shoulder of the roadbed, and again a reasonably well-filled car represents about 75 ft. of roadbed ready for new ballast. The new dipper design is of great convenience in this work.

Overlapping Joint in Gear Case

THE new malleable-iron gear case of the GE-265 railway motor of the General Electric Company incorporates an overlapping joint, a unique feature which keeps out dirt and moisture and which affords a means of making adjustments to compensate for any wear of the supporting brackets. The case embodies the advantages of malleable iron rigidity and strength, yet its weight is no greater than that of the gear case formerly used with this lightweight motor.

Six Metal-Working Machines Combined

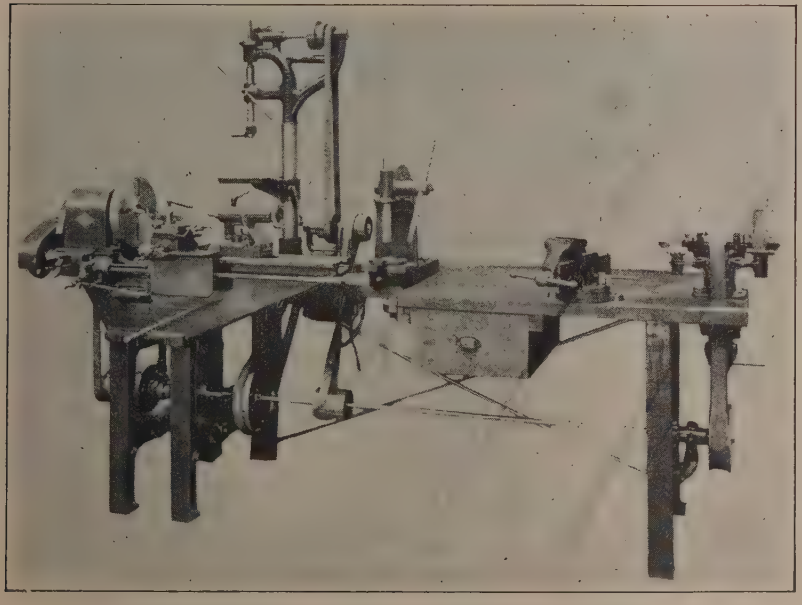
A GROUP of metal-working machines designed to handle the every-day jobs in a garage or small electric railway shop has been developed by the Artisan Manufacturing Company, Cincinnati, Ohio.

The outfit consists of a lathe, drill press, arbor press, vise and grinder head combined with a machinist's work bench. A ½-hp. electric motor is used to drive the machines, as shown in the accompanying illustration. Belt drive from another source of power is optional.

The bench has a hardwood top, 7 ft. x 30 in., with cast-iron legs bolted to it. The lathe has an 11-in. swing over the bed and is 24 in. between centers. It is controlled separately through a friction clutch on the countershaft. Equipment includes large and small face plates, chuck, five tools and four drop-forged lathe dogs. The drill press is rigidly fastened to the left side of the bench and is controlled through tight and loose pulleys. The drill has a capacity of 10 in. and the spindle can travel 3½ in. Table diameter is 8 in. The arbor press is located to the right of the lathe. It will take work up to 10 in. diameter, arbors up to 1¼ in., has a plunger movement of 8 in., a leverage of 36 to 1 and exerts a pressure of approximately 1 ton.

A 36-lb. machinist's vise is included. Its jaws are 3½ in. wide and open to 5 in. Two 6x1-in. emery wheels, one fine and one coarse, are mounted on the grinder at the right of the bench. A double-pulley idler is used to control its drive from a belt which ordinarily hangs loose. One rigid countershaft, running in three self-aligning babbitted bearings, drives all machines.

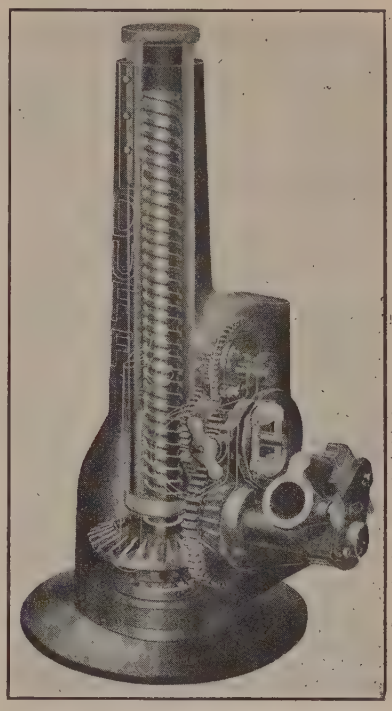
Crated for shipment, the outfit weighs about 1,000 lb. and is 7 ft. 6 in. long, 30 in. wide, 39 in. high.



This Combined Unit Has Six Metal-Working Machines

Lowering Speed Control Feature of New Jack

EMBODYING many features not previously used in jack construction, a new line of self-lowering jacks is being placed on the market by the Duff Manufacturing Company, Pittsburgh, Pa. These jacks range in capacity from 15 to 50 tons, and a special feature is the governor control which assures absolute control of the lowering speed, elimination of possibility of accidents through sudden or uneven dropping of the load, and provides a jack which may be slowed down gradually or stopped instantly at any point without shock or strain on the mechanism. The governor makes it possible in cases where two or more jacks are used together to provide a uniform lowering speed, so that one jack will not lower more rapidly than the other. This eliminates tipping or uneven lowering.



Self-Lowering Jack with Governor Speed Control

The new design has a drop-forged steel top and the standard is prevented from screwing out from under the load by use of an oversized key. A triple pawl holds the clutch with three drop-forged, heat-treated steel pawls. These hold and raise with each stroke. There is but one pawl on the lever socket. In the first position the pawl will raise the load in the usual manner. The second position is neutral. The third position is used for running the standard down without load.

A positive lock which also acts as a brake when lowering the jack gradually holds up the load. Thus, no dependence is placed on springs. A positive stop at the base of the standard prevents overextending the jack beyond the safe limit of the raise. A one-piece shell holds all working parts and bearings in an integral unit and assures perfect alignment of all parts.

The News of the Industry

Springfield Report Presented

Conditions Outlined Under Which New Haven Road Is Prepared to Spend $1,500,000

The expenditure of approximately $1,500,000 in rehabilitating the Springfield Street Railway, Springfield, Mass., will be recommended to the board of directors of the New York, New Haven & Hartford Railroad. Vice-President E. G. Buckland of the railroad made it plain to Mayor Fordis C. Parker and the City Council on Feb. 25 that the company was prepared to proceed, provided the city will support the railroad in carrying out its program, including co-operation in obtaining state legislation to restore control to the railroad of this and other electric railway properties held by the New England Investment & Security Company, and that the city adopt recommendations contained in the report of the joint committee of survey. This committee comprised Clark V. Wood, president of the Springfield Street Railway; W. J. Flickinger, representative of the New York, New Haven & Hartford, and J. T. Battis Woodruff, representative of the city. The Mayor said he would call a meeting of the City Council to determine what course the city would pursue in relation to the conditions set forth.

Improvements recommended to be made include, among other things, the purchase of 50 new cars of the modern one-man type, an enlargement of the bus service, improved arrangements at the Main and Carew Streets carhouse to relieve street congestion due to the running of many cars in and out, double-tracking of Belmont Avenue as far east as Girard Siding and Sumner Avenue as far east as White Street, reduction of the number of car stops in certain cases, greater use of Dwight Street for cars now being routed through Main Street, and improvements of the roadbeds.

Recommendations of changes by the city include the widening of Belmont Avenue between Bellevue Avenue and Oakland Street, widening of Worthington Street between Chestnut and Federal Streets, widening of South Main Street, widening of Main Street between Railroad and Hampden Streets, opening of a new street between Walnut and Oak Streets, to relieve congestion in State Street; extension of Locust Street from Main Street to Columbus Avenue, removal of tree belts at street railway turnouts wherever the distance from rail to curb is less than 18 ft., fewer pedestrian crossings in Main Street and prohibition of all parking in Main Street from Liberty Street to Locust Street between 4.30 p.m. and 6 p.m.

The last-named recommendation, dealing with a question that for months past has been a subject of agitation, is opposed by the merchants. It appears likely to become the principal point of contention in the attempt to bring the parties to an agreement on matters covered by the report of the joint committee.

Survey on in Syracuse

A general planning survey of the city of Syracuse, N. Y., aimed to determine the best methods of eliminating grade crossings and improve general traffic conditions, is being conducted under direction of Frederick H. Fay, Boston expert in transportation and planning. Data have been presented by transit and other agencies, among them the New York State Railways, the Syracuse & Eastern Railway and the Auburn & Syracuse Railroad.

Benjamin E. Tilton, vice-president and general manager of the New York State Railways, reported on passenger and freight statistics for the corporation's Oneida line for 1925 and also for 1920. The number of passengers carried in 1920 was 643,403 and in 1925 the total was 412,717. A falling off in freight shipments also was reported. Harvey D. Gross, general manager, furnished similar data concerning the Syracuse & Eastern and Talmadge C. Cherry, president, on the Auburn & Syracuse line.

"Market Basket" Will Fix P.R.T. Wages

Purchasing Power of Dollar Is to Be Sole Factor in Wage Adjustments—Base Pay Reduced—Economists Heartily Approve Plan—Yearly Readjustment Except in Emergencies

EMPLOYEES of the Philadelphia Rapid Transit Company, Philadelphia, Pa., have accepted a reduction of 3½ cents an hour in their base pay, as a result of the recent "market basket" agreement adopted by joint action of employers' and employees' committees. Hereafter wages will be adjusted on a basis of the purchasing power of the dollar, so that employees will no longer be faced with the possibility of lowered living standards.

This unusual step was taken following a period of two years of intensive research work carried on by the men's own committees. The basic pay of 73½ cents an hour, which is 3½ cents less than the basic pay in use during 1925, was arrived at by general committees representing the men and the company. Hereafter the basic wage agreement will not be altered, the actual amount paid to the men being determined by an index figure which is based upon twelve typical market baskets. The prices of these baskets will be determined from month to month by a bureau working under the direction of the general committees.

To insure stability necessary to proper budgeting, adjustments of wages are not to be made more than once in every calendar year, except when the purchasing power of the dollar varies ten points or more from the market basket index and remains at a point beyond that variation for a period of at least three months. The purchasing power of the dollar shows no such sudden rise or fall in the past, save in time of panic or war inflation, when it was everywhere necessary to adopt emergency measures.

Reduction of wages was not the purpose for which the present decrease of 3½ cents an hour was adopted, the company announced. Rather it was felt desirable so to arrange the wage scale that a part of the employee's remuneration would be dependent upon his own operating efficiency. Provision is now made for a fee to management, based on gross earnings of the P. R. T. property, and payable only after the earning of a return to the owners. Part of this fee will comprise the management's compensation and expenses and part will go to the men in payment for their increased productive effort. Thus the employees will have opportunity for an ever-increasing enjoyment of the goods of this world as they increase their own value to the company.

A number of outstanding economists have approved the new Mitten plan. Among these are Irving Fisher, Jacob H. Hollander and W. Jett Lauck. They are heartily in accord with a program which will insure a proper maintenance of home standards and at the same time give promise of advancing standards of living according to gains in productive efficiency.

More Bus Applications in New York

Application has been made to the Board of Estimate of New York by the Equitable Coach Company to operate bus routes in all boroughs except Richmond. It was submitted on Feb. 26. The applications for franchises submitted by the Manhattan Surface Coach Company, a subsidiary of the New York Railways, and the Surface Transportation Company, a subsidiary of the Third Avenue Railway, were also considered the same day.

Another development of the day was the joint offer of the Brooklyn-Manhattan Transit Corporation and the Brooklyn City Railroad to under-

take borough-wide bus operation in Brooklyn. In a letter to the Board of Estimate the presidents of the two companies declared their willingness to undertake the operation of a comprehensive Brooklyn bus system without giving any details. A definite offer will undoubtedly be made later and presumably the two companies will be willing to exchange some surface line franchises for bus franchises, as other companies owning surface lines have indicated a readiness to do.

The Equitable Coach Company is backed by the J. G. White interests. Its plea was regarded as presenting so many favorable features that Mayor Walker and his associates were said to have been considerably impressed, although, of course, the Board of Estimate members would make no decision on the granting of franchises until all the applicants have been heard.

Another feature of the Equitable offer, which was said to have appealed to the Mayor, was a provision for a 5-cent fare. This rate would be applied to a zone system, but the Mayor and his colleagues were informed that such a plan would benefit the short-haul riders, usually comprising the greater number of bus passengers.

The offer of the Brooklyn companies, signed by William S. Menden, president of the B.-M. T., and H. Hobart Porter, president of the Brooklyn City Railroad, read:

> In line with their obligation to give to the public the best possible transportation, the B.-M. T. Corporation and the Brooklyn City Railroad are prepared to form a bus company to be financed by them and to operate a Brooklyn borough-wide system of buses so to be co-ordinated with existing rapid transit lines and buses as to give to the public the best of service at the lowest possible cost.
>
> They therefore request the opportunity to confer with the members of the Board of Estimate to discuss terms upon which they may co-operate with the city through such proposed new corporation with city representation and supervision to insure co-ordination with existing lines and maximum service to the public. The operating experience on existing facilities of the B.-M. T. and Brooklyn City companies would seem to create the opportunity for agreement as to bus operations in Brooklyn on better terms than might be otherwise obtained.

Work of Expanding Chicago Rapid Transit Being Pushed

Service over the lines of the Chicago Rapid Transit Company to the additional west side communities of Maywood, Bellwood and Westchester is planned to start about May 1.

At present the terminus of the "L" service on the Garfield Park branch of the Rapid Transit Lines is at Des Plaines Avenue, Forest Park. As a result of the operating agreement, service will be extended westward over the Chicago, Aurora & Elgin Railroad to Bellwood and thence southward to Roosevelt Road, Westchester.

Excellent progress is being made in constructing the new track from Bellwood to Westchester. The roadbed has been completed, the tracks laid and third rail installed and three stations and an interlocking tower at Bellwood Junction are under construction.

Another important Rapid Transit Company development is the announcement of plans to construct a new terminal on Wells Street between Jackson Boulevard and Van Buren Street, Chicago, at an estimated cost of $160,000.

The new structure will serve as a terminal for the Aurora & Elgin, as well as furnishing increased loop facilities for the Rapid Transit Lines. It will be a three-story structure, embodying all the latest improvements for the comfort and convenience of the traveling public.

An innovation in station construction will be the placing of the waiting room of the third floor—the track level. A mezzanine will provide a women's rest room and a men's smoking room. On the first floor will be the ticket offices, a passenger concourse, telephone booths and concessions.

Construction work is expected to start early in April. Plans call for completion of the new terminal within six months from the time work is started.

They're at It Again

Phoenix Agitated Over Its Railway Problem—Visiting "Experts" See It a Financial One

Railway operation in the "great open spaces" may not be subject to the foibles of Old Man Weather, but nevertheless it has its problems. Particularly is this true where the destinies of the railway property are in the lap of the municipal government. Take Phoenix, Ariz., for example. The hue and cry which burst upon the normally quiet existence of that thriving community some time ago—contingent on the attempts of certain local citizens to allay the grievous ailments of the property without recourse to outside assistance—finally died away without any one's having so far forgotten himself as to resort to the faithful old "shootin' irons."

But the armistice was not destined to be long-lived. On the surface all was serene, but turmoil was beneath. The city fathers, gazing with mild distrust upon the efforts of their fellow citizens, began to cast about for some one who could tackle the local situation with the sangfroid of the cosmopolite. Nor was it necessary for them to search far. Within the bounds of their own fair domain were found two men who possessed the qualifications which the pilots of the local ship of state considered essential. They were Commander Abner B. Clements, U.S.N., retired, who is spending the winter in Phoenix, and J. Frederick Richardson, formerly prominent in various congressional investigations into aviation and Shipping Board conditions, who contemplates engaging in newspaper publishing in Arizona.

"Ah, ha," said the promulgators of Phoenix laws, "Here are the men who can solve our knotty problem." Forthwith, announcements were made in the local papers to the effect that two eminent authorities on street railway affairs had at last been found to prescribe the hoped-for panacea for the city's transportation ills. This investigation, furthermore, was to cost the city not one red cent, since the two gentlemen, acting in a most generous mood, had been kind enough to donate their services.

After a cursory examination of the task in hand, Commander Clements and Mr. Richardson informed Mayor Jefferson that the street railway situation was not a transportation problem so much as a financing problem.

No sooner had this announcement been made than more pyrotechnics became visible over the Phoenix horizon. A committee of citizens waited upon the city commissioners and delivered themselves of certain pertinent remarks. They professed to be much interested in the reasoning which led to the choice of a former navy man and an authority on aviation and Shipping Board affairs as experts on street railway conditions in arid Arizona. Said they: "These men have reported things to you about a system which you have known for years—that what is wrong with the street railway situation is a financial rather than a railway problem." Great was the professed astonishment of the committee at the conclusions at which the eminent investigators had arrived.

Since, after all, the investigation was costing them no money, the citizens' committee was moved once again to discuss things by word of mouth, rather than with the once popular "persuaders" of the wild 'n' woolly west, so nary a drop of any man's blood was spilled in the Council chamber that morning. Things are now in a simmering stage once more, while the investigators proceed to "investigate" in unruffled fashion. It is noteworthy that the central theme of discourse among the members of the City Commission whenever railway affairs are mentioned seems no more to deal with ways and means of disposing of the property to private interests, but rather with ways and means of making the railway every day and in every way a better municipal property.

Commission Approves Conowingo Project

The Philadelphia Electric Company's petition for approval of the Conowingo project, a $52,200,000 hydro-electric development along the Susquehanna River in Maryland, was allowed recently by the Public Service Commission of Pennsylvania. The decision followed a series of hearings in Philadelphia extending over several months. The testimony also was reviewed by the Public Service Commission of Maryland and a representative of the Federal Power Commission.

The Philadelphia Rapid Transit Company, Philadelphia, Pa., single largest user of Philadelphia Electric current, said that the financial set-up was calculated to increase in rates to consumers. This company's contentions in the main were upheld by the commission, and the Philadelphia Electric Company shortly thereafter complied with the commission's ruling.

Recently the commission received a formal communication from the Philadelphia Rapid Transit Company that, inasmuch as the revisions made in the petitions complied and dispensed with its objections to the Conowingo project, the objections were formally withdrawn.

Electric Road Wins Switching Case

In a decision by Justice Brandeis, the United States Supreme Court on March 1 upheld an order issued by the Interstate Commerce Commission directing that three steam railroads cease discrimination against the Chicago, Lake Shore & South Bend Railway, an electric road operating between South Bend, Ind., and Kensington, a station within the limits of Chicago, in the matter of switching arrangements at Michigan City, Ind. The decision upheld that of the federal district court in dismissing a petition for an injunction against the I.C.C. order sought by the steam railroads.

Originally, the Lake Shore secured an order against the Lake Erie & Western, with which it has physical connection at Michigan City, to remove unjust discrimination for refusal to establish joint through rates and to make switching arrangements. The Lake Erie removed the discrimination by making the arrangements with the Lake Shore.

The Chicago, Indianapolis & Louisville, the Michigan Central and the Père Marquette, all of them steam railroads, also enter Michigan City, but they were not parties to the original action. When unjust discrimination was alleged against them and an order was issued by the I.C.C., they sought an injunction, alleging they had no physical connection with the electric road, that the latter was not essentially a freight carrier and that it has little equipment to exchange with them. The findings of fact of the Interstate Commerce Commission were assailed. The district court refused to grant the writ to the steam railroads. This decision is upheld by the Supreme Court. As a result reciprocal switching arrangements between the steam railroads and the electric line must be established at Michigan City.

Accident Faker Gets Two-Year Sentence

Another accident faker has been brought to book. He is known as Harry Peters. It is said that in a period of about a year he had operated against about thirty railways. That is important, but not quite so important as are his apprehension and subsequent sentence at Elizabeth, N. J., on Feb. 15 to serve a two-year term in prison.

On Jan. 16 the Public Service Railway, Newark, N. J., caused the arrest of Peters (of 1435 N. 29th Street, Philadelphia, Pa.) on the charge of obtaining money under false pretenses from the railway at Elizabeth, on Oct. 7, 1925. On Oct. 6 he was a passenger in a one-man car in Elizabeth and occupied a seat in the rear of the car. An electric light bulb broke. Peters alleged that it had fallen out of the socket, broken, and that the glass had got into his right eye. He was taken to a doctor, who treated the eye, and the railway representative at Elizabeth settled with him for $100. It was then discovered that he had obtained $75 in a similar manner at the Camden office of the company on Sept. 15, 1924, on account of an alleged accident. He at that time gave the fictitious address of Seventh and Penn Streets, Reading, Pa. In each instance he represented himself as being in the long-distance trucking business.

It has since been learned that he operated against the New York Railways and the Third Avenue Railway, New York City; the United Railways & Electric Company, Baltimore, Md.; Philadelphia Rapid Transit Company, the Morris County Traction Company, Morristown, N. J.; the New York, New Haven & Hartford Railroad, the New York Central Railroad, the Erie Railroad, the Baltimore & Ohio Railroad and the Lehigh Valley Railroad.

New Agreement in Chicago Under Discussion

With eleven months of Chicago's car franchises remaining to run, politicians are pulling in many directions and getting nowhere in particular toward working out new agreements. Heretofore there has been the practically unanimous ground of a unified system of surface and elevated lines with a subway, but for the first time a proposal has been made to submit separate ordinances. The Mayor, attacked on all sides, has practically stepped out of the negotiations.

A sub-committee has completed the draft of what it hopes will become the City Council's traction ordinance policy.

Cost plus is one item. A committee of engineers would fix the maximum and minimum figures of the fare fund, determining increases or reductions.

The Surface Lines would continue to pay 55 per cent of its net receipts to the city.

Home rule would be provided by the creation of a commission of five to take over the state commission's responsibilities in Chicago.

Extensions would be built on the basis of gross revenues. A percentage, undecided, would be fixed as the annual outlay.

The report recommends unification of all the lines.

The franchises would be based on the terminable permit principle.

Traction flared up freshly as a political issue by charges of Alderman Arthur F. Albert that a political faction was dictating the future of transportation in the state. He mentioned Senator Richard J. Barr, author of a terminable permit bill in the last Legislature that is to be made the basis of legislation offered to the next assembly. He said:

> The gang that controls the sanitary district has the nerve to shout "home rule" as a platform. The trustees are in a close alliance with the arch foes of home rule and if they get their candidates across Chicago will never have another thing to say about its own streets in the future.

One-Man Car Service in Milwaukee Put Off

The long-heralded installation by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., of one-man car service on its Walnut Street line has been temporarily suspended because the commission is anxious to have the facts and figures presented at the public rehearing in Milwaukee on the matter before a new and final order is issued. So far as the railway is concerned it planned to start the new service on March 1 in accordance with an order issued several weeks ago by the Railroad Commission.

The new order will be issued probably within two weeks and may provide for a trial test of one-man car service in order that claims of both advocates and opponents may be fullly tested. This trial may be conducted by operating one-half of the cars with a one-man crew and the remaining cars with two-men or otherwise by operating all of the cars, except during rush-hour specials, with one-man crews for a certain period. By operating one-half of the cars with one man, members of the commission brought out that the contention of the railway that these cars can maintain satisfactory schedules can be tried out. S. B. Way, president of the company, said:

> The company is confident that actual operation will demonstrate the improved service possible only with one-man cars of the type the company is required by the commission to furnish and that the fears of the comparatively small number of people who have so far expressed themselves will be found groundless.

Electric Road Planned for Florida

It is planned to build an electric railway to link up Central Florida cities with the East and West Coast and open up the great ridge and lake sections of interior Florida. To this end a corporation to be known as the Florida Service Electric Railways will be formed with a capitalization of $10,000,000. The road is to be built in separate units. The first will run from Orlando through Apopka and north to Palatka. The second unit would extend from Orlando to Tampa and St. Petersburg and the third unit through Sanford to Daytona Beach and ultimately link up with Jacksonville to the north, with Miami as its southern terminal. Orlando's location, geographically the heart of Florida and the greatest center of central Florida's population, is believed to be the most desirable from which to operate. Officers of the Apopka Chamber of Commerce have the matter in hand for promotion.

Question of Public Control Renewed in Boston

Considerable discussion is developing over the proposition whether the public operation of the Boston Elevated Railway, Boston, Mass., should be extended for a period of 30 years, as was proposed by the special legislative commission. One of the factors entering into this recent discussion is the Boston Chamber of Commerce. That body has voted to indorse the proposition and has sent a communication to this effect to the legislative committees on street railways and metropolitan affairs. The Chamber of Commerce concludes it is for the best interest of the car riders and the community that public control of the Elevated be maintained for at least 30 years more, as this will pave the way to obtain capital and permit service to be improved. At the same time the chamber favors the general policy that public control ought to be only a temporary expedient.

Eight-Hour Bill Killed in Massachusetts

The Massachusetts trolleymen's eight-hour bill has been defeated in the Legislature by a vote of 18 to 10. Senator Frank B. Phinney, Dorchester, opposed the bill on the ground that it would place a restriction on business. He charged the bill was an attempt to increase the pay of the employees, who hope to get nine hours pay for eight hours work. Senator Gifford, Salem, who favored the bill at its inception, voted against it. He felt that neither the public nor the railways was in a position to stand the extra expense it surely would involve.

J. N. Shannahan Honored by Employees

If John N. Shannahan, retiring president of the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., ever had any doubt of the affection in which he was held by the employees of that system and the esteem in which he is held by the people of the Virginia Peninsula, it was dispelled recently when tribute was paid to him by the employees who have been under him during his fifteen years as head of the system. Men and women expressed in terms stronger than mere words their implicit faith in him. As a climax Mr. Shanahan was presented a testimonial handsomely bound in leather, engraved with his name in gold on the back, containing the personal signature of every officer, director and employee in the system.

Holyoke Power Agreement Case Postponed

The Turners Falls Power & Electric Company, the Holyoke Water Power Company and the Holyoke Street Railway have virtually come to an agreement for the settlement of the controversy raised by the petition of the first-named company to the Massachusetts Public Utilities Commission for a franchise to enter the city of Holyoke to connect and operate the power house to be purchased from the railway as part of a general contract to sell energy to that company. Under the plan now awaiting final adoption the Turners Falls company will withdraw its petition and the Holyoke Water Power Company will supply energy for the power house, on condition that the Holyoke Water Power Company shall buy from the Turners Falls company an amount of energy equivalent to that sold by the Holyoke Water Power Company to the railway. The car company will pay to the Holyoke Water Power Company the same price for energy it would have paid to the Turners Falls company under the arrangement proposed but not approved by the State Department. The Turners Falls company will take over the car company's power plant for $400,000, as previously agreed, and will then convey it to the Holyoke Water Power Company for a market value to be determined.

The Public Utilities Commission had called a rehearing on the petition for March 1, but it granted a postponement to March 22, on assurances that an agreement had been reached on many of the details. Since the original hearing last year the personnel of the commission has changed.

New Jersey Governor Against Federal Rate Interference

Governor Moore of New Jersey has called on the Legislature to petition Congress to enact legislation to limit the jurisdiction of United States courts in the regulation of public utility rates within the states. It is his opinion that the practice of public utility companies in rate cases of applying to the federal statutory court for injunctive relief has been carried on to such an extent in recent years as practically to oust the state of its jurisdiction in the regulation of rates of such companies. He says that the problem of regulation of the service and rates of such companies should be solely within the state's jurisdiction. The Governor said:

> I believe it is an undue interference of the federal statutory court to intervene in the matter of regulation of rates of the companies of the state. This is now done by immediate application for injunction to the federal courts, the effect of which is to suspend immediately the rates of such companies as determined by the board upon a hearing after notice, and after full consideration of all matters necessarily and properly considered in rate cases, and thereby makes futile the effort on the part of the state to regulate the rates of utility companies which exist by virtue of a charter given them by this state.

Everman Plan Accepted in Dallas

The recent Everman recommendation, the basis of which was to increase the fare of the Dallas Railway, Dallas, Tex., to 7 cents, with the provision that five tokens could be purchased for 30 cents, has been accepted, with a few minor changes, by the directors of that company.

The passage of the ordinance has been delayed a few days due to the fact that J. J. Collins, city attorney, who is to supervise the preparation of the ordinance, has been sick. Those closely in touch with the situation feel that if the city attorney's condition will permit a conference will be held at a very early date and the ordinance will be passed without delay virtually as recommended by Mr. Everman, supervisor of public utilities for the city.

The railway, the populace and the officials of Dallas are in agreement on this new program, which will provide funds to make extensions and purchase additional equipment urgently needed.

Obsolete Cars Burned in Spokane

Thirty-six street cars, worn-out and obsolete, have been consumed by the flames in a series of bonfires held under the direction of G. H. Darby, master mechanic of the Spokane United Railways, Spokane, Wash.

The cars were stripped of all worth-while material and were then tipped off their trucks. The trucks were dismantled while the old car bodies were soaked with oil and burned.

Transit Bill for New York Reported Favorably

The Senate Judiciary Committee on March 2 reported favorably Senator Nicoll's constitutional amendment authorizing New York City to increase its debt after Jan. 1, 1928, to an amount not exceeding $300,000,000, said increase to be used for the construction or equipment, or both, of new rapid transit lines. The debts so incurred are not to be included in computing the city's debt limit.

Messrs. Sawyer and Eales Arrive in Australia

Cablegrams from Sydney, Australia, tell of the safe arrival there of W. H. Sawyer, president of the East St. Louis & Suburban Railway, East St. Louis, Ill., and H. W. Eales, chief electrical engineer of the Union Electric Light & Power Company, St. Louis, Mo., who have gone to Australia to conduct a survey of power there for the Victorian government.

Omaha Franchise Ordinance Introduced

The street railway committee of the City Council of Omaha, Neb., has made its report to the committee of the whole. The report of the committee was adopted at this meeting and the city attorney instructed to prepare an ordinance in favor of the Omaha & Council Bluffs Street Railway embodying the terms and provisions recommended by the committee. The measure has since come up on first reading. It seems probable now that the matter will be ready for submission to the voters of the city some time this spring.

Three Railway Systems Connect in Wisconsin

Three of the largest electric railway systems in Wisconsin have been interconnected at Sixth and Clybourn Streets, joining the Chicago, North Shore & Milwaukee Railroad, Milwaukee, Electric Railway & Light Company and the Milwaukee Northern Railway. An interchange of express cars running from Chicago on the North Shore to Milwaukee and then west to Waukesha, Oconomowoc and Watertown on the Milwaukee Electric Railway line, or north to Sheboygan on the Milwaukee Northern, and vice versa, is thus made possible. Arrangements will be made to handle the exchange on excursion trains.

Hearings on Syracuse and Utica Fares on March 10

The Public Service Commission of New York will hold a hearing at Albany on March 10 on the petition of the New York State Railways for permission to charge a 10-cent cash fare or 7½-cent ticket fare in Syracuse and vicinity. A second hearing on the petition of the company for permission to charge an increased fare in Utica and vicinity will also be held on March 10. The Utica proceeding will be conducted in the morning. That on Syracuse will be held in the afternoon.

News Notes

Wage Increase in Sacramento Under Consideration.—Employees of the Pacific Gas & Electric Company, Sacramento, Cal., have petitioned for a wage of $6 for nine hours work with time and one-half for overtime. The present pay is on an hourly basis starting at 51 cents for a beginner and reaching 60 cents for a one-man car operator who has been employed by the company for more than one year. E. W. Florence, division manager of the company, said that the request of employees for more pay would be considered.

Special Review Number at Vancouver.—The British Columbia Electric Railway, Vancouver, B. C., Canada, has issued a special review number of its employees' magazine dated March, 1926. The early development and progress of the company are described by means of entertaining reading, attractive pictures and instructive charts. The March issue contains nearly 50 pages.

Commuters' Rates Out of Louisville Advanced.—The State Railroad Commission has granted the Louisville Railway permission to advance commuters' rates on all of its interurban lines out of Louisville, Ky., operated as the Louisville & Interurban Railroad. This will result in about a 21 per cent increase in ticket books, with no change made in basic rate on cash fares, which is 3 cents a mile. The commutation rates range from seven-tenths of a cent per mile to 1½ cents a mile. About three months ago rates were raised within the city of Louisville by 1 cent and ½ cent on school books. The company had endeavored to discontinue commutation books entirely, but the commission refused to grant the discontinuation. There are seven lines operated out of Louisville, including the Orell, Prospect, Lagrange, Shelbyville, Okolona, Fern Creek and Jeffersontown.

Jitney Permits Still the Issue in Tacoma.—Efforts of Mayor A. V. Fawcett of Tacoma, Wash., to have further permits granted for jitneys which will run in competition with the Tacoma Railway & Power Company have been blocked by the City Commissioners, who favor holding off such permits until the new Council is seated in June. The new men who will become councilmen have announced that they will endeavor to solve the transportation problem, and City Commissioners do not wish to complicate the situation by granting further permits for jitney lines.

Former Application Renewed in Wheeling. — The Wheeling Traction Company, Wheeling, W. Va., has filed a petition with the Public Service Commission to reopen its former application for increased rates, which the commission recently denied. The company declares it has new evidence to introduce in the case. However, no date has been set for a hearing. In a recent application the company sought permission to sell nine tickets for 50 cents, instead of the customary ten for the same amount. The proposition was rejected, as figures advanced for consideration were said to have taken in interstate rates. If another hearing is granted, figures concerning the operation of cars only in the West Virginia side will be placed before the commission. The application was filed by H. L. Mitchell, vice-president of the Wheeling Traction Company.

Safety Isles Planned. — The United Railways, St. Louis, Mo., in co-operation with the St. Louis Board of Education and the Police Department, will construct concrete isles of safety at several avenues. The St. Louis Board of Public Service has been requested to issue permits for the placing of the isles in the streets. The St. Louis Street Department had no funds available for this work so the United Railways donated $1,500, the Board of Education $1,500 and the police $500 to install the isles and protecting "blinker" traffic signals.

Changes at Colorado Springs.—The fare on the cars of the Colorado Springs & Interurban Railway has been reduced from 10 cents to two tickets for 15 cents in that city. The "pass system" has been eliminated. At the same time rail operation was discontinued on the Wahsatch lines and buses started.

Weekly Pass for Greensburg, Pa.—The West Penn Railways added a $1 weekly pass for the one-zone area covered by a cash fare of 8 cents or a ticket fare of 6¼ cents effective March 1. The application is for an experimental period ending May 30, 1926. This is the second weekly pass on the coke region lines of the West Penn Railways. The first was the similar $1 pass at Connellsville, in use since June 1, 1925. The Kittanning & Ford City division, West Penn Railways, installed four multi-zone passes Sept. 20, 1925.

Do You Want a Woman's Page?—In order to test out the interest in a woman's page as a new feature of the *Southern Public Utilities Magazine*, the Southern Public Utilities Company, Charlotte, N. C., is offering three prizes of $5, $3 and $2 respectively for the three best woman's pages submitted. The editor, John Paul Lucas, is interested in knowing if the women readers would co-operate in making a woman's page really worth while and valuable.

Senate Committee Kills Public Service Inquiry.—The committee on finance of the Senate of Pennsylvania has killed the Barr resolution calling before the Senate members of the Public Service Commission to give testimony respecting the decision on the Philadelphia Rapid Transit Company fare case.

Recent Bus Developments

Bus Operation Now Ruled by Arkansas Board

Regulation of buses has been assumed by the Arkansas Railroad Commission under its general authority over common carriers authorized by the railroad commission act of 1921. Its action has been upheld by the Attorney-General. A set of rules and regulations governing bus operation was put in effect on Jan. 1.

This provides that operators of buses must obtain from the commission a revocable certificate of convenience for each route. Operators in business at the time of the adoption of the regulations shall be granted a certificate upon showing that they have complied with the regulations. There must be filed with the commission time schedules, showing rates, mileage and towns on the route. Buses must be maintained in a sanitary condition, heated in cold weather and properly lighted.

Bonding or insurance against accident liability is required. The largest bond is for $50,000 for buses over 20 passenger capacity. Damages to one person are limited to $5,000. Bonds of $1,000 are required for the protection of property. Establishment of a central depot by each company is required. All buses of more than five-passenger capacity must carry a fire extinguisher.

Taxicabs, hotel buses, school buses, sightseeing buses, real estate buses and buses used in private business only are exempt from the rules, as are also buses operating exclusively within the limits of a municipal corporation and other municipalities contiguous thereto.

As mentioned before, no special law has been passed providing for the regulation of buses. Because of this, court action involving the authority of the commission seems likely.

Commission Approves Sale of Bus Routes to Tractions

Approval has been given by the Public Service Commission of Indiana to the sale of all but two of the remaining routes of the Indiana Red Ball lines and the routes of the Hoosier State lines to the Union Traction Company and the Indiana Motor Transit Company, a subsidiary of the Terre Haute, Indianapolis & Eastern Traction Company. Only six other independent lines will be in operation out of Indianapolis when the sales are completed. In the order approving the sale, the commission prohibits the purchasing companies from capitalizing the $32,788 paid for operator's certificates.

The T. H., I. & E. subsidiary is to buy Red Ball certificates to Richmond, Lafayette, Crawfordsville and Martinsville for a consideration of $15,000, excluding equipment. The Union Traction Company is to buy certificates on the Red Ball's routes to Sheridan and Noblesville for $2,400. The Rockville certificate will be sold to Platter & Baldwin for $1,388. Union Traction also is buying the Hoosier Stage line certificates to Muncie and Marion for $14,000. Fred I. Jones, receiver of one of the bus lines and sponsor for the others, declared the sales were made to prevent dissipation of remaining assets.

New Feeder Line in Toledo

The Community Traction Company, Toledo, Ohio, on Feb. 16 started the operation of a feeder bus on Glendale Avenue and Wildwood Road, in the southern section of the city, an extension of the Broadway line, under a new plan of lease direct from the manufacturers with option to purchase. The bus, has a seating capacity of 25. It was furnished by Mack Trucks.

Other feeder buses are being leased from independent operators. The City Council in providing for feeder bus operation denied the right to the company to spend any money to purchase buses, but forced it to lease. It is felt that a change in this policy may result soon following establishment of other lines and their operation at a cost of about twice the revenue collected on them.

Bus Lines at Gary in Separate Company

The Shore Line Motor Coach Company has been formed by Insull interests to take over various bus lines formerly operated as feeder and auxiliary services by the Gary Railways, Gary, Ind. The bus lines radiate from Gary, Ind., and may be extended. The bus line probably will be controlled by the Midland Utilities Company.

Greater Authority Over Buses Wanted in New York

To the New York State Public Service Commission "it seems apparent that the substitution of buses for trolley lines which have ceased to be profitable or in territories which may better be served by buses is inevitable." In discussing the future of bus operation in its report to the Legislature the commission sees the need of an adequate inspection force and the need for further authority for the regulation of the buses. That body said:

> The close of the year finds the bus lines just beginning to function at their best. In the next season there is every reason to believe there will be a further consolidation with wider extensions which will ultimately provide the state with a class of service of the first order. The development of these routes logically follows the completion of state highways. The present comprehensive system of highways invites the establishment of more extensive and better equipped lines.
>
> With the continued growth, the amount of business carried by bus lines in this state, the need for further authority for the regulation of these agencies is constantly apparent. This commission has made recommendations upon this subject in former reports. In the opinion of the commission there should be added to the present public service commission law an article specifying in detail the supervision which the Legislature desires the commission to exercise over bus lines. The law now contains such an article covering every other class of utilities over which the commission exercises regulatory powers. The necessity for legislation upon this subject is recognized not only by the commission and the general public but also by the operators of bus lines. The preparation of proposed bus legislation should have the active co-operation of all interested parties. It is the earnest hope of the commission that adequate bus legislation may be enacted at an early date.

Two other recommendations upon this subject contained in the last annual report of the commission are again renewed, namely, an amendment to Section 5 of the public service commission law specifying more in detail as to the authority of the Public Service Commission and the Transit Commission where a bus line is partly within and partly without the territorial limits of the city of New York, and an amendment of the railroad law which will permit street railways to engage in auxiliary bus transportation business without the necessity of forming separate corporations for that purpose.

New Bus Viewed in Portland, Ore.

A party of railway officials of the Seattle Municipal Railway, Seattle, Wash., City Councilmen, bus representatives and traction men recently spent two days in Portland, Ore., studying the operation of bus lines as feeders for railway lines as worked out by the Portland Electric Power Company. Interest was especially keen in a new parlor observation type stage for service between Seattle and Everett. The new type was evolved by the Pacific Northwest Traction Company. A feature of the bus is an observation cupola at the rear, accommodating twelve passengers. The cupola is raised 5 ft. to insure an unobstructed view.

Permit Sought for Extended Service.—The Key System Transit Company has applied to the California Railroad Commission for a certificate of public convenience to operate bus service between Oakland and Hayward.

Program of Rehabilitation Under Way. — Immediate extension of the Rockford City Traction Company service at Rockford, Ill., has been announced by Adam Gschwindt, receiver of the company, who has purchased six new buses for immediate use. The buses are taken under lease from the Yellow Truck & Coach Manufacturing Company with a view to their purchase. This indicates a policy of the receiver to attempt rehabilitation of the lines by adequate service to the public. There are now ten buses in service.

Bus Application Under Advisement.—The Illinois Commerce Commission has under advisement the application of the East St. Louis & Suburban Railway, through the Alton, Granite & St. Louis Traction Company, to operate a bus line between Alton, Ill., and St. Louis, Mo., via Brooklyn, Venice, Madison, Granite City, Nameoki, Mitchell, Hartford, Woodriver and East Alton. At the hearing on the application in East St. Louis, Ill., representatives of the Illinois Traction System and the Alton & Woodriver Bus Company objected to the new buses accepting local fares in the territory now served by the Illinois Traction and the Alton & Woodriver Bus Company.

New Scale of Fares on Bus Lines.—For convenience of passengers on the Sylvan Hills and Atlanta Avenue bus lines of the Georgia Railway & Power Company, Atlanta, Ga., who desire to use only the buses, the fare has been reduced from 10 to 5 cents. No transfers to streets cars are given with 5-cent fares. The change in no way affects the arrangement by which 10 cents is charged for combination bus and car rides. Previously a straight 10-cent fare was charged, with street car transfers issued if desired. Now the charge will be 5 cents for all except those who desire to continue their journey by street car. For those transferring from street car to bus, a 3-cent charge, in addition to the 7-cent street car fare, will continue to be in effect.

New Lines Out of Springfield Planned.—The Illinois Traction System will shortly apply to the Illinois Commerce Commission for certificates of convenience and necessity for the operation of a number of intercity bus lines radiating out of Springfield, Ill. The new bus lines will be supplementary to the present interurban lines operated by the company.

Buses Desired on Five-Mile Line.—The Willapa Electric Company, operating the electric railway between Raymond and South Bend, Wash., has appealed to the State Department of Public Works for permission to discontinue the line and substitute buses. J. R. Snider, manager of the company, expresses the opinion that the line, which is now losing money, may be made profit-earning by the substitution of motor equipment. It is proposed to purchase three buses, each seating twenty or more passengers. The car tracks will be torn up and the equipment sold. The line is 5 miles long.

Seeks to Replace Car Service.—The Menominee & Marinette Light & Traction Company has petitioned the City Council of Marinette, Wis., for permission to replace street car service with bus service, on a trial basis at least, on its unprofitable Hall-Pierce Avenue line. If the Council approves of the change a similar fare will be charged, with transfer privileges for bus and railway patrons.

Three Lines in Akron Approved.—After twice refusing to permit the Northern Ohio Traction & Light Company, Akron, Ohio, to operate express buses at a 10-cent fare the City Council has passed an ordinance sanctioning three such lines. The first will be an extension of the 10-cent express line that has been running from Cuyahoga Falls on the north to South Main and Cedar Streets, with no stops in Akron. Stops will be permitted at points to be selected by the city safety director. Free transfers will be issued from express buses to other buses or street cars. A 3-cent transfer will be issued from street cars to regular or express buses. Express bus stops will be regulated by the city safety director.

Wants Buses Substituted.—The Denver & South Platte Railway, operating the electric railway from Englewood to Littleton, Col., about 6 miles, has asked the State Public Utilities Commission for permission to abandon its tram cars and to substitute buses. The reason for the change is an economical one, the railway failing to pay. The matter is under advisement. To carry out the bus features the company has incorporated the Denver & South Platte Transportation Company, capitalized at $25,000. H. W. Hartman is one of the incorporators. The city fathers of Englewood wish to pave South Broadway, but say that the work will have to wait the outcome of the railway's move to abolish the cars. The cars have been operating eighteen years.

Financial and Corporate

Last Details Under Way

Final Moves Being Made in Kansas City Railways Receivership Sale Case

At the continued hearing on Feb. 24 on the confirmation of the sale of the Kansas City Railways property, Blatchford Downing, attorney for the second mortgage bondholders, was permitted to take depositions in the case before a notary public. Mr. Downing had previously contended that such depositions should be legalized for the occasion. Powell Groner, attorney for the Newman syndicate, purchasers of the property under foreclosure sale, said a special commission should be appointed for the purpose. Mr. Downing will begin taking the depositions on March 9 in New York City and will then go to Washington, Detroit and Chicago to obtain further statements from other parties resident in these cities.

Frank P. Sebree, attorney for the stockholders of the defunct railway, expressed the wish to ask Mr. Newman how much his interest in the first mortgage bonds had cost him.

Judge Stone was requested by R. J. Higgins, attorney for the trustees, to eliminate that part of Mr. Sebree's objections. Mr. Newman's own attorney, Powell Groner, said his client is willing to meet any and all queries, but Mr. Groner intimated that the price paid for the bonds by Mr. Newman is of no concern to any one else. Decision in the matter of the elimination of such questions was reserved, but a remark attributed to the court appears to indicate that this line of attack will be futile in so far as the court is concerned.

The Newman syndicate is credited with having offered the holders of the second mortgage bonds a settlement of 20 cents on the dollar, but the offer was refused. Mr. Groner expressed the doubt that all of the holders of second mortgage bonds understood the liberal terms which had been offered them and rejected. It was also intimated that Mr. Groner plans to make some depositions for his own side of the case while he is in New York.

In speaking of the offer that his clients had rejected, Mr. Downing said that his clients always had a hand outstretched to receive a plausible offer, but they had always discovered that the reorganization managers were trying to lure them around the corner on one pretext or another.

Judge Stone expressed regret that proceedings are being prolonged. He set April 12 as the date for a hearing on the depositions and the grounds for other objections.

Attorneys in the case were urged to arrive at some agreed valuation of the property, so that the adequacy of Mr. Groner's bid of $8,000,000, made at the sale under foreclosure, might be argued intelligently.

On Feb. 25 the Kansas City Public Service Company was granted permission to operate in Kansas as a Missouri corporation. Simultaneously the Wyandotte Railways was chartered to own the railways properties in Kansas City, Kan.

The most recent action of the charter board removes one of the last remaining obstacles to the operation of the railways properties in Kansas, although the delay of the hearing on the confirmation of the foreclosure sale augurs for the elapse of some months before the public service company shall have the actual operation of the property.

Chicago, Aurora & Elgin Corporation Sold—New Officers

Thomas Conway, Jr., and associates of Philadelphia have sold to Samuel Insull and associates of Chicago their stock holdings, constituting a majority in interest, in the Chicago, Aurora & Elgin Corporation, which in turn controls through stock ownership the Chicago, Aurora & Elgin Railroad, owning and operating a high-speed electric railroad serving the western suburban districts of Chicago.

At a meeting of the board of directors of the Chicago, Aurora & Elgin Corporation, held in Philadelphia, Alba B. Johnson, Samuel B. Stinson, A. E. Pfahler, Gordon B. Anderson and E. C. Faber resigned as directors of the Chicago, Aurora & Elgin Corporation, and Samuel Insull, Britton I. Budd, R. Floyd Clinch, B. J. Fallon, J. H. Gulick and G. R. Jones were elected as their successors. At the request of Mr. Insull, Mr. Conway has consented to remain a director of the holding company for the time being. Lewis B. Williams, Cleveland, and A. B. Conant, Boston, also continue as directors.

As soon as the necessary corporate action can be taken, Mr. Conway and his associates will retire as officers and directors of Chicago, Aurora & Elgin Railroad Company. J. H. McClure will retire as vice-president and general manager and will go to Dayton, Ohio, as the operating head of the Cincinnati & Dayton Electric Railway, which is about to be taken over by Mr. Conway and associates.

Another Step Nearer Foreclosure in St. Louis

United States District Judge Faris has ordered the St. Louis Union Trust Company, trustee under the mortgage securing the $30,300,000 general 4 per cent bonds of the United Railways, St. Louis, Mo., to issue an additional $6,000,000 of such bonds to the reorganization committee through Receiver Rolla Wells to be exchanged for $4,100,000 in underlying bonds and $1,900,000 in cash. The unissued portion of the general 4s, totaling $3,700,000, will be canceled. The order by Judge Faris paves the way for Receiver Wells to complete his contract with the reorganization committee. This provides that Mr. Wells shall use the $1,900,000 cash received for the new bonds and $2,300,000 funds now on hand to pay off $4,200,000 of receiver's certificates.

There is now only one more legal matter to be disposed of prior to the sale of the property at foreclosure. This is the presentation of unsecured claims.

Gary Railways on Dividend Basis

Operating revenue of the Gary Railways, Gary, Ind., in 1925 was $1,204,729, according to the annual report of the company made public on Feb. 24.

The Gary Railways is one of the operating subsidiaries of the Midland Utilities Company. It furnishes local transportation service in Gary, and operates lines connecting the steel manufacturing city with East Chicago, Hammond, Valparaiso and Hobart.

The name of the company was changed from Gary Street Railway to Gary Railways in August, 1925, and the properties of the Gary & Valparaiso Railway, Gary Connecting Railroad and Gary & Hobart Traction Company were purchased and all merged into one system.

Passengers carried by the company in 1925 totaled 15,597,784, compared with 12,527,906 in 1924. The month of December was the largest in the history of the company, 1,559,872 passengers being carried.

Preferred dividends paid during 1925 amounted to $7,662. Common dividends declared amount to $84,969.

The company obtained during the year a wide distribution of its class A preferred stock in the territory which it serves. A sale of this stock by employees under the customer-ownership plan began on Sept. 8, 1925, and ended Dec. 31, 1925. During this period 4,257 shares were sold, of which 3,036 were purchased by residents of the Calumet district of northwestern Indiana in which the company operates. A large number of such shares were sold on a

INCOME ACCOUNT OF THE GARY RAILWAYS

	1925	1924
Operating revenue	$1,204,729	$998,418
Operating expenses	927,693	773,289
Net operating revenue	$277,036	$225,128
Other charges, including taxes	88,176	73,813
Total income	$188,859	$151,315
Interest on funded debt	73,795	69,523
Net income	$115,064	$81,792
Dividends declared	92,631	.....
Balance to surplus	$22,432	$81,792

SURPLUS ACCOUNT OF GARY RAILWAYS

Balance Dec. 31, 1924		$269,306
Net deductions from surplus		82,668
		$186,638
Net income for year, as above	$115,064	
Less dividends declared	92,631	
		22,432
Surplus Dec. 31, 1925		$209,070

monthly savings plan and were not issued at the close of the year. In the city of Gary 2,336 shares were sold to 1,442 subscribers. This was an average of 1.7 shares per subscriber. In the Gary Railways organization 92.58 per cent of the employees subscribed for stock.

Since 1918 $1,500,000 has been spent in modernizing the company's property. Track mileage has been increased 50 per cent in this interval, car equipment almost 200 per cent, power equipment 200 per cent and car mileage operated more than 100 per cent.

The Gary Railways was one of the first street railways in the country to adopt both efficient light-weight safety cars and trail trains. Auxiliary motor coach service has been established as a feeder to the regular railway service to "pioneer" into newly developed residential sections of the city where the population does not yet justify railway service.

The Gary Street Railway in 1918 carried 7,529,381 passengers. In 1925 15,597,784 were carried, or an increase of 107 per cent over 1918.

The gross revenue of the railway property in Gary increased from $385,579 to $998,418 in seven years.

The company operates its cars over 72 miles of track and 79 motor passenger cars and fourteen trailers are used.

The industrial zone within which the Gary Railways operates has a population of approximately 200,000 people. It is a territory that is growing rapidly and the Gary Railways has steadily increased its service and facilities for serving the public and to meet the demands of this industrial growth.

Two Long Island Properties Sold

The property of the New York & Long Island Traction Company was sold by former Lieutenant-Governor Wood, acting as referee in a foreclosure action brought by the Union Trust Company, Cleveland, on Feb. 25 in the Nassau County Court House at Mineola, L. I. Louis Carruthers, who represented a committee of the bondholders, bid $300,000 for the property as a whole. It was then offered in units. The bids for the units totaled $308,100.

The five franchises held by the town of Hempstead and the various villages went to the H. E. Salzberg Company, 50 Church Street, Manhattan. The remainder of the property was taken by the bondholders. There was some lively bidding for the real estate at Hempstead and at Rockville Centre, but the committee took it at $50,000 for each parcel. The committee also bought in the right-of-way over the route between Hicks Neck, west of Freeport, westerly into Rockaway Avenue, Queens, for $115,000.

The rolling stock, including 45 cars, was bought in by Mr. Carruthers for the committee at $11,250. The tracks, including 41 miles, and overhead equipment went to the committee, also represented by Arthur G. Peacock, counsel for the company, at $22,500. The machinery and office equipment went to the committee for $9,500. Mr. Peacock said the line would be abandoned, but he thought service would be continued until the buyers had taken title within 30 days and the courts had dismissed all proceedings.

The sale on Feb. 25 was followed on Feb. 26 by the sale of the rolling stock, buildings, equipment and franchises of the Long Island Electric Railroad. This property went to the American Community Corporation, a real estate concern of Brooklyn. The railway brought $115,000.

$98,196 Decrease in Net in Louisville

Automatic Increase in Fare Followed Reduction in Barometer Fund Below $200,000

All directors and officers were re-elected by the Louisville Railway, Louisville, Ky., at the annual meeting of stockholders. Judge Alex P. Humphrey resigned as general counsel for the company. He was succeeded by his son Churchill Humphrey, who had been assistant general counsel. J. J. Blackerby became the employee representative on the board of directors. He is a trainman.

The statement of earnings for the year ended Dec. 31, 1925, compared with 1924 is shown in the table below.

The year 1925 was the third of operation under the ordinance which became effective on Sept. 17, 1922. The net result of three years operation was a reduction of the barometer fund from $350,000 to less than $200,000. As a result the automatic fare provision of the ordinance became effective on Feb. 1, 1926, and the fare was increased from five tickets for 30 cents and 7-cent cash fare to five tickets for 35 cents and 7-cent cash fare.

Passenger traffic during the early months of 1925 was somewhat lighter than for the corresponding period in 1924. The last three months of the year showed considerable gain in traffic, however, and the total passenger traffic, compared with the preceding three years was as follows:

1922	Total passengers carried	91,899,745
1923	Total passengers carried	97,670,397
1924	Total passengers carried	97,739,267
1925	Total passengers carried	97,134,565

President Barnes says the problem of the cars maintaining their scheduled time is becoming more and more difficult to solve. The number of automobile licenses issued in Louisville during the last four years was as follows:

	1922	1923	1924	1925
Trucks	5,551	6,250	7,400	8,083
Private automobiles	26,650	29,891	40,916	46,379
Motorcycles	.....	.....	235	247
Dealers	.....	.....	88	97
	32,201	36,141	48,639	54,806

In this connection Mr. Barnes says the elimination of jitneys would do much toward relieving congestion in the central part of the city and would give considerable additional revenue to the system.

By request of the Board of Public Works and of the Board of Safety, the first loading platform was put in service on Broadway at Fourth Street on Jan. 14, 1926. These loading platforms will be placed at transfer points on Broadway, the other loading points being protected by concrete posts. It is believed that they will be of considerable service to the car passengers and will also speed up automobile traffic on Broadway.

During the year 68 cars were vestibuled and equipped with rear doors and folding steps.

Power economies put into effect in 1923 and 1924 have continued to show good results. The comparative costs of power station operation and maintenance are as follows:

	1922	1923	1924	1925
Car-miles operated, system	13,283,844	13,934,309	14,071,118	13,749,956
Kilowatt-hours, system	51,293,156	52,709,508	53,914,663	52,723,099
Cost of maintenance and operation of power plants	$535,380	$514,843	$454,949	$414,818

COMPARATIVE INCOME STATEMENT OF THE LOUISVILLE RAILWAY

	1925	1924
Operating revenues:		
Revenue from transportation	$4,239,571	$4,247,314
Other operating revenues	189,544	202,364
Total operating revenues	$4,429,115	$4,449,678
Operating expenses	2,962,512	*2,952,612
Net revenue from operations	$1,466,602	$1,497,066
Taxes	431,000	401,000
Operating income	$1,035,602	$1,096,066
Non-operating income:		
Louisville & Interurban Railroad	88,637	126,365
Other non-operating income	10,432	12,165
Total non-operating income	$99,070	$138,530
Gross income	$1,134,673	$1,234,597
Deductions from gross income:		
Interest on bonds and notes	651,750	651,750
Miscellaneous debits	2,366	4,093
Total deductions	$654,116	$655,843
Balance available for dividends on stock	$480,557	$578,753

*Adjusted.

Power has been generated exclusively by the High Street power station since April 7, 1924, although the use of one power house has necessitated a higher degree of maintenance to see that the machinery is operative. Although the Campbell Street plant has been closed down, it is being kept in condition so that in emergency it can be put into service and produce its full complement of power. According to Mr. Barnes the purchase of 8.9 per cent of the company's power requirements from the Louisville Gas & Electric Company since November, 1924, has proved satisfactory and economical.

The company now has 182 miles of single track, of which 140.85 miles is in paved street. Mr. Barnes says:

> Figured on an average life of 25 years in paved street, this would require an average annual replacement of 5.63 miles or 29,726 ft. It will be noticed from the replacement figures for the past four years, which are below this average, that we may expect heavier expenditures in track replacement. The present annual depreciation allowance of $175,000 does not provide for depreciation on track or roadway, so that all our expenditures for these purposes must be carried as maintenance.

The intensive safety work on the

property in all departments has been followed up as in previous years. The increased efficiency of operation as a result of this campaign is reflected in the following figures:

	1922	1923	1924	1925
Accidents	3,272	3,404	1,825	1,534
Miles operated per accident	3,323	3,380	6,390	7,432

This improvement is made in spite of the large increase in number of automobiles and trucks operated. The safety dinners have been continued that are given monthly to the carhouse operating the greatest number of miles per accident, those carhouses also being invited that operate in excess of 25,000 miles per accident. To these safety dinners are also invited the other units on the property that operate three months without an accident.

One hundred and seventy-nine employees of the three companies operated in 1925 without an accident compared with 136 in 1924.

The Louisville Railway Co-operative Association continues to function admirably. The number of employees on the three properties on Dec. 31, 1925, was 1,664. Of these 1,330 are members of the association; a great proportion of the balance of non-members of the association are not eligible on account of age or the temporary nature of their employment.

Of the Connelly award Mr. Barnes said:

During 1925 the company lost one of its most faithful employees, Anthony F. Connelly, chief inspector, who died on Dec. 3. In recognition of his services to the company for a period of more than 50 years, one of the company directors, who does not wish his name to appear, has offered an award, hereafter to be called the "Anthony F. Connelly Award," which will consist of a suitable certificate, a medal and purse of $75 and to which the company will add a trip to the annual American Electric Railway Association convention, to be given to that employee who shall be nominated by fellow-employees and selected as most worthy by an award committee. The award is to be based upon sustained record of excellent public service throughout the year or upon one or more individual instances of unusual and outstanding public service, whichever in the opinion of the award committee constitutes the greatest contribution to public welfare and to the public service record of the company.

Fifty names have been submitted for the 1925 Connelly award. From among them the committee will select the winner. Announcement of the winner will be made in the very near future.

At the close of business on Dec. 31, 1925, all the accumulative and current dividends on the preferred stock had been paid.

Loss in January in Toledo

A net loss of $3,789 to the stabilizing fund resulted from January business of the Community Traction Company, Toledo, Ohio. Gross revenue was cut $20,462 under what it was in January, 1925. The decrease is chiefly due to falling off in riding and lower interurban rentals. Operating costs were $226,767 this January as against $230,613 for January, 1925. Revenue passengers carried totaled 4,344,174 in January compared with 4,477,301 in a similar month of last year.

The company now has 49 one-man cars in operation and a considerable saving has been effected in this operation despite the increase in car mileage from 561,566 passenger car-miles last year to 579,919 car-miles January, 1926.

Traffic, Fare and Wage Figures for January

The number of revenue passengers carried by electric railways during January compared with 4,477,301 in the Electric Railway Association, was slightly greater than the number carried in January, 1925. The rate of increase as compared with the rate shown in the latter months of 1925 is somewhat retarded. The following are the figures for revenue passengers reported by 209 companies for the months of January, 1926, and 1925.

January, 1926	746,133,280
January, 1925	742,450,394
Increase, per cent	0.50

Average cash fares in 272 cities of 25,000 population and over:

Feb. 1, 1926	Jan. 1, 1926	Feb. 1, 1925
7.6470 cents	7.6213 cents	7.4963 cents

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Feb. 1, 1926	Jan. 1, 1926	Feb. 1, 1925
Average hourly rate, cents	56.52	56.30	55.98
Index No. (1913 = 100 per cent)	207.61	206.61	205.43

Hampton Property in Virginia Public Service

Purchase of the Southside Virginia Power Company and formation of a holding company to control Virginia properties has been announced by Fitkin Utilities, Inc. The new holding company will be known as the Virginia Public Service Corporation.

The Southside Virginia Power Company was purchased from Charles and Ira Vaughan, Philadelphia. It operates hydro-electric plants in the south central part of Virginia which distributes through a transmission system at 66,000 volts. The system is connected with the Roanoke Rapids plant of the Virginia Electric Power Company, Richmond.

The Virginia Public Service Corporation becomes a subsidiary of the National Public Service Corporation and includes the Alexandria Light & Power Company, Virginia Western Power Company, Virginia Northern Power Company and Newport News & Hampton Railway, Gas & Electric Company.

Net Income on B.-M. T. Higher.—For the seven months period ended Jan. 31, 1926, operating revenues of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., and affiliated corporations were $26,142,270, against $25,062,625 for a similar period in 1925. The total operating expenses increased from $16,432,352 for the seven months period of 1925 to $17,008,778 in 1926. The gross income was $7,936,636, against $7,484,157 for the 1925 period. After the consideration of income deductions, net income was $3,378,057 for the seven months period ended Jan. 31, 1926, compared with $2,938,133 for a similar period ended Jan. 31 the year previous.

Net Income Increases.—An increase in the net income of the United Railways & Electric Company, Baltimore, in January, after fixed charges, compared with the similar month of last year is shown by the company's report. The total for this January was $70,135, compared with $35,530 for the previous January. Revenue passengers increased from 18,764,851 in January, 1925, to 18,952,322 this January.

Net Income on Brooklyn City Higher.—For the seven months period ended Jan. 31, 1926, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $6,652,393, against $6,625,686 for the seven months period ended Jan. 31, 1925. The net corporate income after income deductions was $852,619 for this year's period, against $819,106 for the seven months period ended Jan. 31, 1925.

Records Show Another Payment on Seattle Purchase.—Another payment has been made by the city of Seattle, Wash., on the street railway purchased from the Puget Sound Power & Light Company in 1918. Ed L. Terry, city treasurer, telegraphed $1,344,825 to the city's fiscal agent in New York to meet payments due March 1. Of this sum, $833,000 is payment on the principal and $291,700 on interest on the railway purchase. The rest was to meet payments on other municipal bonds. The remainder due on the $15,000,000 purchase price of the Seattle Municipal Railway is $10,835,000.

Service Abandoned Until April.—Local trolley service on the New York State Railways in Canandaigua, N. Y., during the winter was discontinued on Feb. 17. Under the terms of its franchise the company is not obliged to furnish trolley service from Dec. 1 to April 1, although this provision has never before been invoked. This action by the railway follows rejection by the city of the company's proposal to replace its electric system with a year-round bus service. Such opposition to this plan developed at hearings that the traction company abandoned the scheme.

January Results in St. Paul Disappointing.—With an increased rate of fare for tokens from 6 cents to six tokens for 40 cents the St. Paul City Railway, St. Paul, Minn., made only $1,924 more in January, 1926, than in January, 1925. Instead of carrying an estimated total of 6,709,000 passengers the number was 6,280,000. Unusually light snows and high temperature are believed to have cut the trolley travel appreciably. The income was about $27,000 short of the allowed 7½ per cent on $16,000,000 valuation. Total operating revenue for the month was $429,263, compared with $425,157 in 1925, but operating expenses advanced from $312,414 to $320,874. On the other hand, through reduction in taxes by the board of abatement of $6,562 for the month the expenses were reduced that amount. Equipment costing $9,000 was extra expense. Gross income for January was an increase of $1,924, or $73,191, compared with $71,266 in 1925.

Personal Items

Tom Elliott Mill Executive

Officer of Car Building Company Becomes President of Big Southern Ginning Company

Thomas Elliott, vice-president and general manager of the Cincinnati Car Company, Winton Place, Cincinnati, Ohio, has been elected president of the Continental Gin Company, with headquarters at Birmingham, Ala. The company has its main plant in Birmingham, with other plants at Prattville, Ala.; Dallas, Memphis and Atlanta for the manufacture of cotton gins, cotton seed crushers, steam engines, Diesel engines and other machinery to operate the gins and crushers. Mr. Elliott and several influential Southern business men recently acquired extensive interests in the company. He expects eventually to take up his residence in Birmingham, but has made no arrangements to leave the car company and will retain some connection with it.

A Field Familiar to Mr. Elliott

Offhand it might seem that this was a big jump by Mr. Elliott from car building to mill manufacturing after 22 years spent in the former, but it is really nothing of the kind. As indicated incidentally in the interview with Mr. Elliott which was published in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 27, page 385, he has back of him an experience along mechanical lines covering many years spent in the South in territory in which the Continental Gin Company now operates. In fact, his appointment to the post at Birmingham is a testimonial to his abilities from associates with whom he first came in contact when he was serving as a master mechanic for the street railways at Atlanta under the McAdoo régime.

His new work is really a throwback to the old days, for in the early '90s he was the master mechanic and chief engineer of a cotton mill at Knoxville, Tenn. One of the big things that he did on this job was to eliminate roll breakage trouble, a source of constant annoyance in all mill operations up to that time.

From Railway Operator to Car Builder

Tom Elliott got into the car building business because he was known never to shirk a job. He went to Cincinnati ostensibly as chief engineer of the Cincinnati Traction Company in charge of cars, overhead lines and the power station. New shops were built too large for the immediate requirements of the system for repair work and it was decided to start construction of cars. Mr. Elliott was drafted for this work temporarily by W. Kesley Schoepf, then president, with instructions to find a man to take charge of the car plant. Impatient of what appeared to him to be delay on the part of Mr. Elliott in filling the post, Mr. Schoepf a few days later calmly announced to Mr. Elliott that since he had not found the man for the job, Mr. Elliott would have to take it for himself. So the destiny was shaped of the man who later became vice-president and general manager of the Cincinnati Car Company.

Everett W. Sweezy General Manager at Alliance

Everett W. Sweezy is the new general manager of the Stark Electric Railroad, Alliance, Ohio. Occasionally a very big job falls to the lot of a young man. This is what happened in the case of Mr. Sweezy, whose sheepskin can hardly show any indication of age, for it is only four years ago that he was graduated from Harvard University. Immediately thereafter he went into business, joining Harris, Forbes & Company, New York, investment bankers, who have specialized in utility issues. He held this position until last summer.

E. W. Sweezy

In his short apprenticeship he impressed his superiors with his ambition and courage. When the need arose in Alliance for some one to command a losing concern, Mr. Sweezy was selected to assist in developing the 32 miles of interurban which operates between Canton and Salem. He has now been studying the transportation problem there for about six months. The company, sold late last year to Eastern capitalists, was forced into the bus business because of competition with the railway. This was before Mr. Sweezy went to that city. His experience, however, has made him a stanch believer in the electric railway as opposed to the bus. Recently he stated that buses were not a serious competitor of a modern street railway service. Largely as a result of his urging, officials of the Stark Electric Railroad have outlined an improvement program for this summer in which about $400,000 will be spent.

D. C. McClure Resigns at St. Joseph

D. C. McClure, who has been general superintendent of the St. Joseph Railway, Light & Power Company, St. Joseph, Mo., for the past two years, has resigned and has gone to Chicago to serve as vice-president of the Central Public Service Company. This company has its headquarters in Chicago, but the actual working organization is spread out over six states. Some of its properties are in Canada. These units are light, gas and power companies in towns of from eight to forty thousand.

Mr. McClure went to the company at St. Joseph two years ago from the Public Service Company of Colorado. He has been with the Doherty organization since 1913 with the exception of two years spent in the army during the World War.

Mr. Kuertz Leaves Cincinnati Post

W. Jerome Kuertz, street railroad director of Cincinnati, Ohio, for the last six years, stepped out of office on March 1 to resume his law practice. Mr. Kuertz tendered his resignation to Col. C. O. Sherrill, city manager, on Jan. 1, but was asked by the city manager to remain in office until various matters connected with the electric railway and motor bus situation in Cincinnati were settled.

Mr. Kuertz established a fine record while in office. He took an important part in the negotiations which brought about the return of the electric railway system to the Cincinnati Street Railway from the Cincinnati Traction Company.

Mr. Kuertz succeeded W. C. Culkins, executive vice-president of the Cincinnati Chamber of Commerce, as street railroad director. Prior to that time, Mr. Kuertz was assistant city solicitor. When former Mayor George P. Carrel was elected four years ago, he reappointed him.

William Kerber, resident manager of the M. A. Hanna Company, is likely to be Mr. Kuertz's successor.

J. E. Carnes Heads Cincinnati Bus Division

Appointment of Jesse E. Carnes in charge of the bus transportation department of the Cincinnati Street Railway, Cincinnati, Ohio, has been announced by J. P. Stewart, general manager. The bus transportation division is a new department. It will be kept entirely separate from the street railway, both in its personnel and auditing.

The railway plans to operate a number of bus routes in connection with its electric system. Mr. Carnes became associated with the company in 1904 as a conductor. Later he was transferred to the schedule department. For the last five years he has been an inspector. The headquarters of the new department will be in the old Reading power house, which is being converted into a garage. Mr. Carnes will be assisted by John Helmlick and Dewey Newport.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

C. S. Sale Outlines Production Plans

American Car & Foundry Motors Will Operate Two Plants—Colonel Hall in Charge of Production

Major engineering construction activities of the American Car & Foundry Motors Corporation will be concentrated at the Detroit plant, formerly used for railway car manufacture, according to a recent statement made by C. S. Sale, president of the company. Although some rearrangement of tools and equipment is required for the conversion of this plant, it is in general well adapted to bus production, and the necessary changes have already been started and are progressing rapidly.

Facilities now available at the Detroit plant will make possible the production of 30 vehicles a day. These, together with the property available for expansion there, are expected to take care of production requirements for some time. It is thought this plant will be completed for manufacturing operations about May 1 of this year. Present plans call for the concentration of all standard bus and track construction in Detroit. Special units, on the other hand, will probably be handled at the Fageol plant at Kent, Ohio, as there is a continual demand for various modifications of standard chassis, such as special treads, seating arrangements or other body features. The capacity of the Kent plant will be particularly suited to this work.

In line with the general policy of providing all forms of equipment required by existing transportation agencies maintained by the new Brill Corporation, American Car & Foundry Motors will produce trucks particularly adapted for railway requirements, as well as buses and motors. The first type of truck to be produced will be for high-speed, heavy-duty service on pneumatic tires. Work has also been started on the design of a new smaller bus unit than the standard Fageol chassis. This will embody a smaller six-cylinder engine, which, although of smaller bore and reduced power output, will incorporate the standard Hall-Scott engine design features, which have been so popular on the larger engines. Present plans contemplate the starting of production on these smaller buses some time in July of this year, according to Mr. Sale. In addition, it is expected that the first truck unit will be available by September.

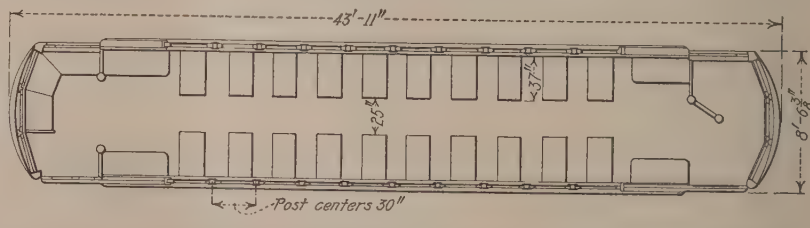
Absorption of the Hall-Scott Motor Corporation brings into the Car & Foundry Motors plant, as vice-president in charge of engineering and production, Col. E. J. Hall, who won world-wide renown during the war as one of the co-designers of the famous Liberty airplane motor. American Car & Foundry Motors shares the good fortune of other companies marshaled under the Brill Corporation banner, in being unusually well equipped with executives and engineering talent of the first order.

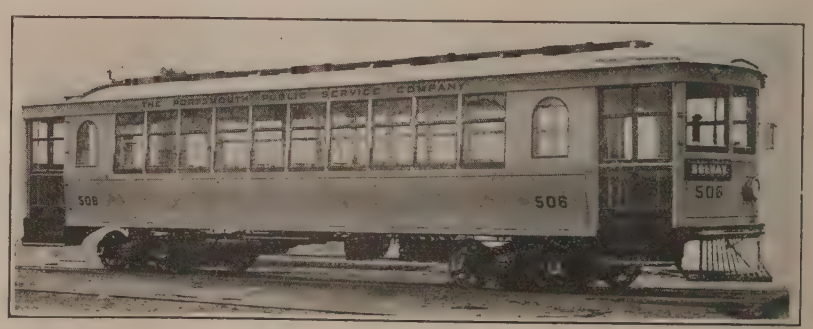
New Cars Built for Portsmouth

Portsmouth Public Service Company, Portsmouth, Ohio, recently purchased three new cars from the Cincinnati Car Company, Winton Place, Ohio. These cars are arranged for one or two-man operation, with passengers entering at the front door and leaving at the rear when operated by one man. Each will seat 55 passengers. The seat cushions and backs are of a deep spring construction upholstered in genuine brown Spanish leather. Vestibule seats are of the folding type.

Dimensions and general information follow:

Weights:		
Body	12,155	lb.
Electrical equipment, including four G.E. 25-hp. motors	5,012	lb.
Air brakes, including safety control	1,385	lb.
Trucks	8,248	lb.
Total	26,800	lb.
Length over all	42 ft. 11	in.
Length over body	33 ft. 3	in.
Length of platform	4 ft. 10	in.
Rail to top of trolley base	10 ft. 5 11/16	in.
Rail to bottom of side sill	28 11/16	in.
Rail to step	16	in.
Step to platform	14	in.
Width over all	8 ft. 6 3/8	in.
Post centers	30	in.
Clear height inside	7 ft. 3	in.
Width of seat	37	in.
Width of aisle	25	in.
Door opening	42	in.
Truck centers	23 ft. 9	in.
Wheelbase	5 ft. 0	in.
Size of wheels	26	in.
Doors	Sliding	
Type of heaters	Electric	
Type of ventilators	Exhaust	
Vestibule seats	Folding	





Design of New Portsmouth Cars Provides for Comfortable Seating of 55 Passengers. Ample Window Space Affords Good Illumination

Edward Buker Forms New Concern

Formation of a new firm to handle seating material and seating equipment for steam and electric railways and buses is announced by Edward Buker. The firm will be known as the Coach & Car Equipment Corporation. Its headquarters will be in the Railway Exchange Building, Chicago, Ill.

Mr. Buker heads the organization. He was formerly manager of railroad sales for the Heywood-Wakefield Company, with headquarters in Chicago. He has had long experience in railway affairs, both in actual railway practice and in affiliated manufacturing lines. After he was graduated from the University of Illinois, in 1908, he served for three years as a car apprentice with the Pullman Company. Next he served a number of years in steam railroad work and then entered the employ of the Galena Signal Oil Company in 1919 as a mechanical expert and salesman. A year later he was appointed Western sales manager of the Rome Iron Works. In 1920 he became manager of railroad sales for the Heywood-Wakefield Company.

Brake Shoe Profits Rise

American Brake Shoe & Foundry Company for 1925 reports net operating profit of $2,786,607, against $2,454,904. The earnings, after allowing for preferred dividend requirements, equaled $13.57 a share earned on the 156,093 shares no par value common stock outstanding, against $11.54 a share earned on the common in 1924. After payment of dividends and other deductions the surplus was $1,188,712 and the profit and loss surplus was $8,119,314.

Joseph B. Terbell, chairman, in his report to stockholders, said:

> Our working capital position, which had been depleted during the past few years on account of additions to capital assets, is now $9,569,412. Orders so far received in 1926 show a slight increase over the same period last year.

Edwin B. Meissner Foresees Industry Awakening to Its Opportunity

President of St. Louis Car Company Discusses Status of Car Design Development—Senses a New Spirit of Optimism and Enthusiasm—Believes Industry Is Taking the Initiative in Building Increased Traffic and Good Will

AN INTERVIEW

By Charles Gordon

"THERE is apparent a new spirit in the electric railway industry. There is present a renewed confidence and a revived courage. Enthusiasm has been rapidly growing ever since the last Atlantic City convention. The road ahead looks wider and straighter. The public is awakening to its own needs. It is clearing the route to progress and the industry is becoming alert to the possibilities."

The speaker was Edwin B. Meissner, president St. Louis Car Company. He was answering a question regarding the outlook for the industry. But I attached to his words a deeper significance. To me they seemed in a sense an expression of gratification at the fruition of a cherished desire. They defined not only an existing situation but a long-sought objective. They indicated something of the viewpoint which has supported Ed Meissner in his steady climb from the position of an office boy at $8 a week to the control and presidency, at the age of 41, of the second largest electric car building company in the industry.

We talked in his unpretentious office in St. Louis. With the characteristic reticence of electric railway men toward talking for publication, which has sometimes been a handicap to the exchange of ideas in the industry, he hesitated at an interview. But we met on common ground—a mutual interest in the upbuilding and rejuvenation of an industry.

My first question drew the response quoted at the beginning of this article. It suggests something of the spirit which has dominated the man in maintaining confidence in car building as an enterprise and the electric railway field as a market. Back in 1911 he was suddenly plunged into this business after a long apprenticeship in electric railway operation. That had been a severe apprenticeship, but it developed the determination and persistence that enabled him to wring success from an enterprise beset with many difficulties and discouragements.

When the late John I. Beggs purchased control of the St. Louis Car Company in 1911, Mr. Meissner was taken to St. Louis from the Milwaukee Electric Railway & Light Company and made assistant to the president. In 1916 Mr. Beggs retired from active contact with the car company and Mr. Meissner became vice-president and general manager. In 1924 he was made president. In November, 1925, he demonstrated his continuing faith in the car building business by purchasing Mr. Beggs' controlling interest in the company. At the same time he did something more. He took into partnership all department heads, shop foremen and a large percentage of his employees through the medium of stock ownership. Thus he not only demonstrated his own confidence in the electric railway industry, but he also enlisted that of his subordinates and employees.

Edwin B. Meissner

When he became identified with the car company, it had in its wake a series of reversals and financial difficulties that presented far from an attractive background on which to build. During the succeeding five years the road continued to be a rugged one. To Mr. Meissner's energy and faith largely is attributable the company's survival and progress.

THIS is the third of a series of interviews with the heads of car building plants and other prominent manufacturers. Rapidly growing interest in the improvement of electric railway equipment throughout the industry makes the views of these manufacturers particularly significant at this time.

Thus his expression of confidence in the electric railway industry impressed me as being amply supported by the record of his own contact with it. The testimony offered by his experience added conviction to his words and gave increased significance to his views. As we delved further into various phases of present conditions he answered my questions freely, reacting to the opportunity of contributing from his own enthusiasm to the upbuilding of the industry's spirit.

"What has been the principal factor during recent years in limiting the devopment of electric railway equipment?" I asked.

"A delayed awakening to the necessity of improvement," he replied. "Many operators, and their financial superiors, have in a sense lacked an appreciation of the need and demand for something better in railway equipment than has been in use for a number of years. There was a general feeling that electric railway cars were about as efficient and satisfactory as could be desired or expected. This opinion was in the minds of both operators and manufacturers. When competition from automotive vehicles arose, the electric railway industry failed to take the necessary steps promptly to meet the situation. Effort was concentrated on economy rather than on improvements which would attract patronage.

On my further question as to whether a change in viewpoint is materializing, he continued: "Most emphatically yes! Operators and builders alike are today giving increased attention to the factors which make cars more attractive as well as to those that produce economy. Thought is being directed to the lines and appearance of cars in the effort to make them more inviting. Color combinations of exterior and interior are attracting attention as never before."

"Do you think that attractiveness of equipment affects riding even when used for mass transportation in city service?" I persisted.

"For a long time there was only one way to ride," he said. "The public had no choice. It had to be satisfied. The railway industry was lulled into a sense of security—and some carelessness. The automobile brought competition. It brought novelty. It brought unaccustomed luxury. It was backed by the most intensive sales effort the country has ever known. Its use spread from pleasure to business. Comfort, conven-

ience and speed formed an irresistible combination. The cost of transportation became a secondary factor. The American people found something that pleased them and they were ready to forget the cost. Electric railways began to feel the effect in the form of depleted revenues, while their own operating costs mounted rapidly during wartime and post-wartime conditions. The industry struggled for several years but was at a loss to find a way of meeting the new conditions. Economies effected through curtailment of service only aggravated the condition. But today there has emerged a new point of view. The industry has taken the offensive. Improved, attractive equipment has proved itself to be an effective weapon. Congestion and parking difficulties have become allies. Experience is now showing that passenger patronage can be won back to the comparative safety and economy of electric car riding by the provision of equipment which appeals to the American sense of progress and pride."

Here was a summary of the situation that called for further discussion. "Do you feel that the condition of electric railway equipment affects a company's relations with the public in the community it serves." I asked.

"There is no question of that. The public reacts favorably to visible evidence of progress and improvement. Regulatory bodies in turn reflect the viewpoint of the public that they represent. Improved equipment offers the opportunity of winning a more friendly attitude from both the public and its representatives. It is encouraging to note that there is a decided tendency to recognize the problems of the railway industry. Visible evidence of the desire to effect improvements, which is afforded by new and attractive equipment, will lend additional impetus to the present tendency to relieve railways from unfair, restrictive regulatory and taxation burdens."

The subject of regulation naturally suggested rate of fare.

"I believe that the public is fair," he said. "It is more interested in the character of service than in the small difference in cost which usually determines the color of the transportation company's balance sheet. That it is willing to pay for improved service has been demonstrated in several cities where the management has made an earnest effort to provide it. New, lightweight and attractive cars will win a rate of fare ample to support good service and at the same time pay a proper return to the investor. There are many properties today on which improved cars equipped with modern devices for safety and speed have resulted in increased riding and a friendly public disposed to grant financial and operating relief to the railway."

"How do you view the outlook for the small property?" I asked.

"There is ample opportunity for the average small property to improve its situation. Because of the more intimate contact which the small town manager has with his public, he must be particularly alert to the opportunity which this offers. I have in mind a comparatively small property which was about 'on the rocks' because of automotive competition aggravated by the condition of its own cars. These were old, poorly maintained and expensive to operate. The management, taking courage from the example of others who had improved their situation under similar conditions, replaced the old equipment with five new cars. The public responded immediately. Today this little property is in sound condition. Lack of faith in its management would long since have resulted in complete abandonment."

It seemed desirable to develop these subjects further, but there were many other questions in my mind. One of these was noise reduction, and I therefore swung to that. "What are the prospects for reducing the noise of car operation?" I asked.

"Modern cars are in general much less noisy than older equipment," was the reply. "This is partly attributable to lighter weight combined with improved truck and spring design." Much of the noise of present car operation is caused by old heavy and run-down equipment. The cars built during the last few years show a decided improvement in this direction. It must be borne in mind that quiet car operation is dependent upon the condition of the track. Rail joints, crossings and special work in poor condition will cause noisy operation despite improvements in the cars themselves. But modern light-weight cars in themselves make it possible to keep the track on a given property in much better condition. Forgetting for the moment the matter of economy in track construction cost that light cars make possible, it has proved next to impossible, even on expensive types of construction, to keep track in proper condition when joints and crossings are subjected to the pounding of heavy obsolete equipment."

"What, in your opinion, is the outlook for the interurban road?" I asked next.

"The interurban road is coming back strong. Highway congestion is having its inevitable effect. The interurban lines, to a large extent operating on private right-of-way, can be equipped to make faster time and insure a greater degree of safety than is possible on the public highway. Much has been accomplished in improving interurban service by the application of equipment that makes possible frequent headways and high acceleration and braking rates combined with increased passenger comfort."

"Do you consider that light-weight interurban cars can be built for safe operation up to maximum speeds of say 50 or 60 m.p.h.?"

"Under present conditions I would say that the ideal formula from the standpoint of safety and comfort is roughly 1,000 lb. for each mile per hour maximum speed. That is to say, a 50,000-lb. car seems to me to afford the ideal combination of weight and strength for 50 m.p.h. maximum speed operation, whereas higher speeds would probably dictate slightly heavier cars."

"In your opinion, are there any advantages in building cars for such service to weigh above these figures?"

"That to a large degree is a matter of personal opinion and choice for safety and comfort. There seems little reason for increasing weight above 60,000 lb. This, of course, depends upon the size of car desired. For a 50-ft. over-all car, I would set 60,000 lb. as a maximum for operation at speeds of 60 m.p.h. It must be remembered, however, that the advantages of frequent service tend to favor comparatively small cars of the lightest possible construction consistent with safety and comfort. Also that more rapid acceleration and braking obtained with such cars holds down the maximum speed required to make a given schedule speed."

"Does experience in the construction of light-weight cars indicate that it is possible to give the degree of riding comfort in such equipment that can be obtained with heavy construction?"

"Light weight affords the opportunity for improved service through quick acceleration. Riding comfort is dependent on truck and spring design rather than on weight. The automobile industry has learned that weight is not necessary to easy riding. On the contrary some of the comparatively light cars achieve as good as or better riding than do much heavier designs even on rough roads."

"Does the equipment trust method of financing new cars offer a satisfactory method of replacing existing obsolete equipment?"

"I had the privilege of being called on to take part in the discussion at one of the meetings during the October convention of the American Electric Railway Association and the subject of purchasing cars on a deferred payment plan basis was brought up during that meeting. I made a statement that properties in reasonably good standing can purchase cars on a basis of a small per cent down payment with the balance spread over a period of from three to five years and at a cost very little above the cash price. Interest rates on such paper are reasonable because car trust paper is recognized in banking circles as one of the best investment securities."

On the outlook for car building business in 1926 Mr. Meissner said:

"Prospects for the year are very bright. Several sizable orders have been placed and many inquiries are being received. The need of much new equipment is being considered throughout the country. The importance of modernization, which was the keynote of our last convention, seems to have taken hold generally. There is a new spirit in the industry and I look for increasing activity during the current year. By next fall I feel that the industry will have clearly manifested a determination to modernize its equipment and definitely to take the offensive in establishing the convenience, comfort and attractiveness of the service that can be offered by electric railways."

New Westinghouse Company in Japan

Westinghouse products will be distributed thoroughout the Japanese Empire by the Westinghouse Electric Company of Japan, newly organized as a subsidiary of the Westinghouse Electric International Company, to give proper service to the many old as well as the new users of Westinghouse apparatus in Japan. The principal office is in Tokyo.

Bus Maintains Its Position in Limelight

Economic Trends and Present Tendencies in Design Are Pointed Out by Manufacturers—Future of Co-ordinated Bus and Trolley Service Is Predicted—Spirit of Optimism Prevails

SINCE at least 35 per cent of all electric railway lines in the country are now operating co-ordinated bus and trolley service, interest among the operators may naturally be expected to remain at a high point concerning the present and future trends of the bus. Some individuals may be thoroughly "sold" on the bus, believing implicitly in its future; others may be skeptical concerning the surety of that future, but all must agree that the present finds the bus very much alive and one of the greatest aids which the canny operator may turn to his advantage.

By far and large, the balance of opinion among the companies which now operate buses in conjunction with their trolley services seems to favor an attitude of confidence in the future of the bus. Naturally, then, economic trends, tendencies of design, possibilities of further co-ordination of bus and street car service, and such similar subjects continue to occupy a position of importance in the eyes of the industry.

In an effort to give a well-rounded consideration to these various subjects a number of the leading manufacturers of buses were interviewed. Replies from these sources contained much interesting data, and in general the producers were inclined to agree rather closely on the more general phases of the question.

It must be remembered that bus service may roughly be divided into two classes, the first being the application of buses to handling mass transportation in crowded metropolitan districts and the second interurban and commuter service to outlying districts. In the former it is quite natural that emphasis is placed on increased capacities and less attention given to the matter of comfort and of esthetic appearance. In the latter type, however, the trend is all toward the de luxe idea, and there is the opportunity to supply service which will rival the private automobile for comfort and flexibility.

Naturally the adoption of de luxe equipment, enlarged seats, increased knee room, smaller and more attractive appearing vehicles must result in increased fares to the rider. But the average individual is pretty well sold on the idea that "something for nothing" is very much of an anomaly in this world and he is generally willing to pay a fair return for the greater comfort which is his in the newer type of equipment. While the street car is up against certain definite conditions which will prevent the carrying out of this de luxe idea beyond certain limits, because of the fact that it is essentially applicable to mass transportation and must be operated to meet the requirements of the greatest number of people, the bus is not bound by such factors. It may be used in co-ordination with street cars to provide a well-rounded transportation system, adapted alike to the desires and requirements of the banker and the laborer.

Future Rests with Railways

Speaking of the competition between the bus and the previously established forms of transportation A. J. Brosseau, president of the International Motor Company, has this to say:

> It has been said by men in a position to understand the trend of the bus-train-trolley situation that the bus will never supplant completely existing forms of transportation, but will supplement them with the peculiar type of service which the fixed track transit lines cannot supply. It is my sincere belief that the bus question will simmer down shortly to operation on a sound, economic basis. If it is found that it is cheaper to operate buses over a certain route, the bus will be run, but if rail operation is better and cheaper, the rail is the thing.
>
> Existing transportation companies are the logical operators of buses from every viewpoint. They have the capital and the ability to carry on bus operation in a manner that will bring back their former patrons. There is profit in the bus business or it would not continue to exist and to thrive. That profit might just as well be made by the companies who were the pioneers in transportation as by the newcomers.

Carrying on this same vein of thought, Charles H. Wondries, manager of the bus sales department of the Studebaker Corporation, says:

> I believe that this present year will witness the elimination of a great deal of wasteful competition and duplication of service, either through the failure of incompetent operators or the consolidation of competing lines. This step in the development of any business is necessary and will do more than any other thing to promote a healthy and sound growth of bus transportation.

Need for Standardization

Some manufacturers remark the tendency among street railway companies to think that they can design more suitable buses than the producers of that equipment. This, they say, is a continuation of the same tendency that is expressed in the purchase of electric railway rolling stock, wherein each operating company specifies an individual type of car, while in reality a very few types, standardized in their principal features, would doubtless be a whole lot better. In other words a great many of the changes specified by the operating companies are just that—changes and not improvements. The electric railway engineers should get together with the engineers of the bus manufacturers and lay out certain accepted standard designs and then agree to take those standardized models for their own use. In this way the manufacturers believe that a very material saving could be effected in the cost of finished buses.

Types of Buses

No discussion of this nature would be complete without some reference to the gas-electric bus. It looms large in the future because of several very important operating advantages which it has over the mechanical drive. It is still an open question, however, as to whether the gas-electric will effect a saving in operating cost for the reason that it adds considerably to the weight of the job and increases tire and gasoline costs somewhat.

Fageol Motors Company believes that for interurban service what they term the "semi-headroom coach," having the general appearance of an enlarged automobile but with large plate glass windows and luxurious finishings, is apparently the best job and that it will take the place of many of the sedan types which are now making the long runs between cities.

This company also states that there is a noticeable trend toward greater power and a greater number of cylinders. It goes on to say:

> This tendency has been so fast that while we had expected to build about 50 per cent four-cylinder and 50 per cent six-cylinder engines last year, the demand got clear ahead of us, and approximately 80 per cent of our total production was equipped with six-cylinder bus engines. Those manufacturers who have not yet developed the six-cylinder engine will be at a great disadvantage before the present year is over.

On the matter of "service" offered by some manufacturers in connection with their equipment, opinion is divided. Some take the view that this is a highly desirable feature, while others are outspoken in their criticism. The latter group feels that as the railways become more and more familiar with bus operating practice and maintenance methods they will depend less and less upon the service offered by bus manufacturers, preferring to take care of their own maintenance after the established practices in connection with their regular rolling stock. This will put the sales advantage with the manufacturers who are conducting their sales policies along the lines followed by companies selling other equipment in larger volume to the railways, namely, direct factory representation. Thus the distributor, dealer and factory branch will be largely eliminated.

Savings from this step in marketing cost may be expected to reach 50 to 75 per cent, in the opinion of this manufacturer, and he believes that it will be only a matter of a short time before the railways as a whole will realize that this is a sound practice in marketing bus equipment for their use. He says: "The so-called 'service' features offered by the ordinary motor truck marketing system really constitute a very expensive crutch, which is paid for three or four times before you get it, and at least double its regular value after you get it."

Needed Improvements

A number of needed improvements in the bus field in general were suggested. Important among these is the need for an improved type of power transmission, which will get away from the selective type transmission and give a smoothness of accleration comparable to gas-electric operation, but at the same time will eliminate the extra weight necessary for the gas-electric drive. Steering gears of greater strength and durability are also to be desired.

Baggage arrangement is another leading problem in operation over the longer routes. Manufacturers are giving considerable thought to the manner in which baggage should be handled

in intercity runs with parlor car types of buses. It seems probable, in the opinion of one official, that this problem will eventually be met by the adoption of separate fast trucks which will enable the companies to accept trunks or packages up to the customary railway limit.

All of the bus manufacturers have passed the practical weight limit, states one concern, and they must begin to scale down on the bulk of material that goes into the units. At the same time the equipment must maintain present capacities or possibly carry even more passengers. Lighter and stronger materials are necessary, together with designs that will give adequate strength, with less material.

Babbitt Metal Consumption in January

The Department of Commerce announces the total apparent consumption of babbitt metal, based on reports received from 27 firms, as 5,151,926 lb. in January, as compared with 4,878,806 in December and 5,683,183 in January, 1925. This consumption is calculated from sales by manufacturers and consumption by those firms (among them several important railroad systems) which consume their own production. In the following table the sales of babbitt metal are shown separately from the consumption in the producing plants:

BABBITT METAL CONSUMPTION

(As shown by sales and consumption by producers, in pounds)

1925	Total (Apparent Consumption)	Sales (By Manufacturers)	Consumption (By Producers)
January	5,683,183	4,620,815	1,062,368
February	5,164,619	4,103,340	1,061,279
March	5,644,288	4,395,901	1,248,387
April	5,126,416	3,928,136	1,198,280
May	5,081,668	4,189,558	892,110
June	5,074,966	4,085,125	989,841
July	5,184,196	3,694,386	1,489,810
August	5,441,823	4,068,706	1,373,117
September	4,621,033	3,579,780	1,041,253
October	5,550,247	4,169,870	1,380,377
November	4,954,683	3,534,026	1,420,657
December	*4,878,806	*3,910,160	968,646
Total	*62,405,928	*48,279,803	14,126,125
1926			
January	5,151,926	3,707,615	1,444,311

*Revised.

Pressed Steel Car and G. E. Get $5,000,000 Brooklyn Order

Application has been made by the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., to the Transit Commission for approval of a plan for awarding contracts to the General Electric Company and the Pressed Steel Car Company for 67 articulated three-car units. Announcement that the corporation planned to purchase the equipment was made last December.

The order will comprise 201 steel subway car bodies, each three-car unit including four trucks with motors on each truck. The Pressed Steel Car Company submitted the contract for bodies and trucks approved by the B.-M. T. directors and the General Electric Company submitted the approved contract for motors and other electrical equipment. The total cost of the order will be about $5,000,000.

Rolling Stock

Springfield Street Railway, Springfield, Mass., has included the purchase of 50 new cars in its program of improvement outlined for that city, provided the local government meets certain recommendations suggested to it as essential to the proper working out of the plan, digested elsewhere in this issue.

Hydro-Electric Railways, Toronto, Canada, is planning the purchase of twenty double-truck cars for use in Windsor.

Chicago & Joliet Electric Railway, Joliet, Ill., has announced plans to purchase ten new interurban cars for its Joliet to Chicago service. Seven builders have supplied specifications for the new cars and will be asked to submit bids. Each car will have a 52-passenger capacity.

Track and Line

Cincinnati Street Railway, Cincinnati, Ohio, has made application to the Director of Street Railroads of the city to relay the car tracks on Madison Road from Vista Avenue to Elmhurst Place, a distance of ½ mile.

Erie Railways, Erie, Pa., will double-track West Eighth Street from a point 150 ft. east of Poplar Street to a point 100 ft. west of Cascade Street. Under the terms of the ordinance the company is to widen the thoroughfare a full foot on either side between Cherry and Cascade Streets at its own expense.

Memphis Street Railway, Memphis, Tenn., is now improving two projects in trackage, one in the north section and the other in the south. Trilby rail weighing 122 lb. is being put down on both improvements, replacing 70-lb. rail. The equivalent of 4,300 ft. of single track is being installed on the first job and 1,300 ft. on the second.

Pacific Electric Railway, Los Angeles, Cal., will replace with heavier rail 14.7 miles of inbound track between Valley Junction and Vineland near El Monte. This improvement will be started shortly and will entail an expenditure of $296,000. D. W. Pontius, vice-president and general manager of the railway, stated that 90-lb. rails would replace the 70-lb. previously used on this section, which is a part of the main line to Pomona.

Metal, Coal and Material Prices

Metals—New York	Mar. 2, 1926
Copper, electrolytic, cents per lb	14.125
Copper, wire base, cents per lb	16.00
Lead, cents per lb	8.87
Zinc, cents per lb	7.68
Tin, Straits, cents per lb	63.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.725
Somerset mine run, Boston, net tons	2.175
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	1.575
Central, Ill., screenings, Chicago, net tons	1.125
Kansas screenings, Kansas City, net tons	2.425
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.08
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$0.98

Power Houses, Shops and Buildings

Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, has announced plans for the construction of a carhouse, tracks and overhead wiring at its South First Street property at a cost of $225,000. The change will be made to accommodate expansion of the Quaker Oats plant. The new carhouse site is 300 x 140 ft. and two blocks of new track will be laid.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has completed the erection of its new $150,000 garage on Kinnickinnic Avenue, built to house the company's 130 buses. The garage is 183 ft. long and 240 ft. deep.

Altoona & Logan Valley Electric Railway, Altoona, Pa., generating 3,000 kw. for the operation of the cars in Altoona, Juniata, Hollidaysburg and Tyrone, will abandon its power plant and buy power from the Penn Central Light & Power Company, Altoona. Four substations will be erected by the Penn Central, one station at Hutchinsons, east of Altoona, to include two 750-kw. rotaries; one station at Twentieth Street, Altoona, to include two 750-kw. rotaries; one at Lakemont Park Hill, to contain one 500 and one 200-kw. rotary; one at Fostoria, 6 miles from Altoona, to contain two 200-kw. and one 100-kw. rotaries. Work on the substations will be started at once.

Chicago & Joliet Electric Railway, Joliet, Ill., plans to build two new substations at a cost of $240,000. The power stations will provide power for the Joliet city and Lockport lines and the present St. Louis Street plant will be abandoned when the new ones are opened.

Trade Notes

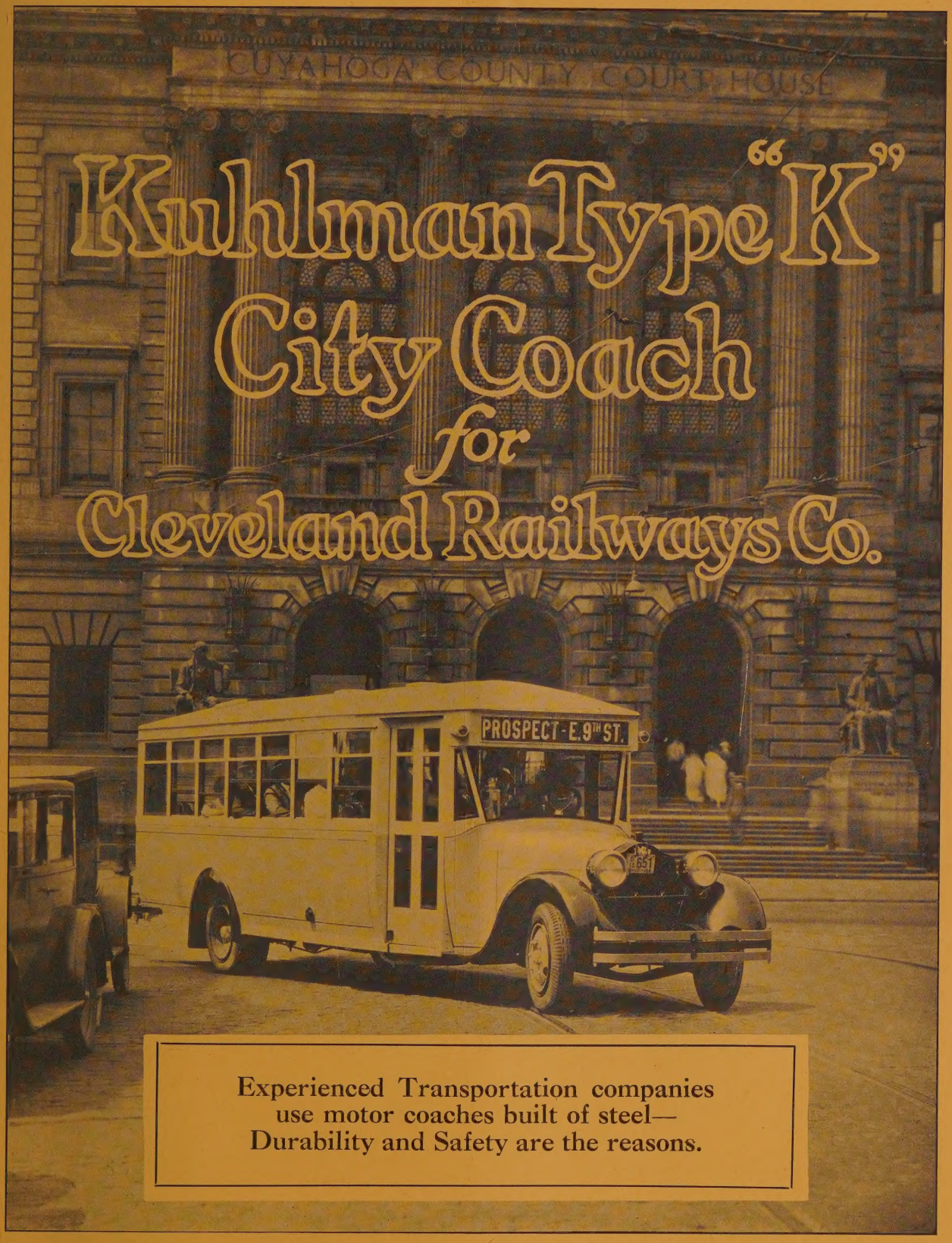
Wagner Electric Corporation, St. Louis, Mo., announces the removal of its Omaha office to 2566 Leavenworth Street on Jan. 25.

F. H. Reagan has been elected president of the Locke Insulator Corporation, Baltimore, Md.

Concrete Products Company of America announces the removal on March 1 of its Eastern sales office from the Chamber of Commerce Building, Newark, N. J., to 1812 Packard Building, Philadelphia, Pa.

H. S. Durant has been appointed manager of the cold rolled strip and spring sales department of the American Steel & Wire Company, Chicago. He succeeds Lewis Johnson, who died recently.

C. V. Root recently joined the Electric Service Supplies Company, Chicago. In 1912 he became affiliated with Stone & Webster and enlisted in 1917. Since then he has been connected with the Western Electric Company, Davis Company and Westinghouse Company. Mr. Root is to cover the Chicago territory in the interests of floodlighting.

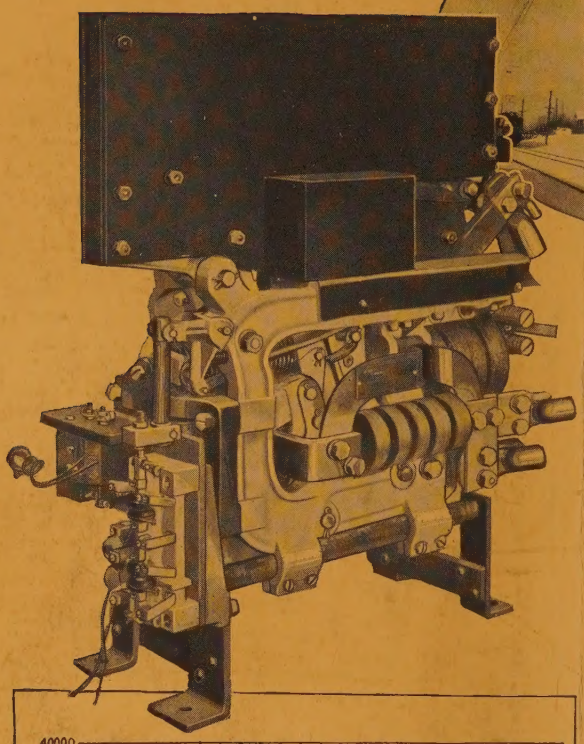


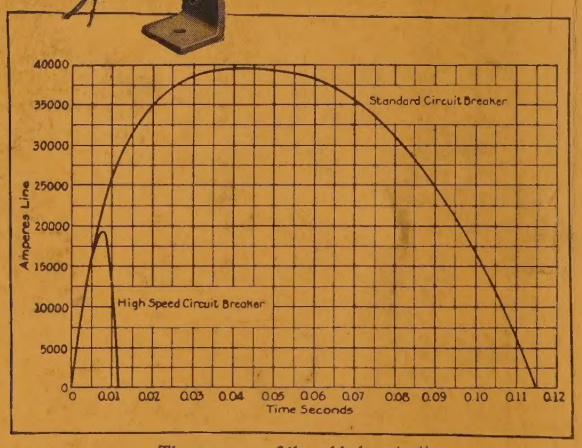
Kuhlman Type "K" City Coach for Cleveland Railways Co.

Experienced Transportation companies use motor coaches built of steel— Durability and Safety are the reasons.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.





The measure of the added protection

More are going to Chicago and to Japan

For the substations that will feed power to the Illinois Central's new electrified terminal at Chicago, more than 100 G-E High-Speed Breakers were ordered as necessary equipment.

An order for 50 G-E High-Speed Breakers was recently received from the Imperial Government Railways of Japan.

Existing G-E installations number more than 900—installed not only in this country but throughout the world. These are some of the foreign users:

Mexican Railway Co., Ltd.
Canadian National Railways
London & Port Stanley Ry., Canada
Paulista Railway, Brazil
Bethlehem, Chile Iron Mines Co.
Hershey Cuban Railway
Spanish Northern Railway
Paris-Orleans Railway
South African Railway
Victorian Railways, Australia
Java State Railways
Imperial Government Railways, Japan

Bulletin 44742.1 describes the G-E High-Speed Breaker. Your G-E office has copies.

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GENERAL ELECTRIC